NETWORK WORLD

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

AN INTERNATIONAL DATA GROUP PUBLICATION ◆ VOLUME 11, NUMBER 25 ◆ JUNE 20, 1994

OpenView deal to widen AT&T mgmt. portfolio

BY JIM DUFFY

New York

Users will soon be able to manage a wide array of AT&T products and services from the industry's leading net management platform as a result of an alliance to be announced next week between the carrier and Hewlett-Packard Co.

Picture this: AT&T to offer video dial tone. Page 6.

AT&T and HP are expected to disclose an OEM arrangement through which AT&T's business units will market HP's OpenView. AT&T is also expected to port to the HP platform its own hardware and service management applications, as well as software distribution and systems management tools.

See **OpenView**, *page 70*

Lotus to snatch up SoftSwitch for $70m

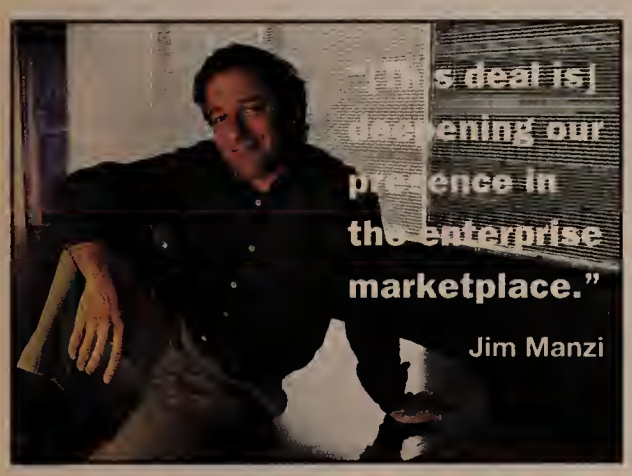
BY ADAM GAFFIN

Cambridge, Mass.

Lotus Development Corp. expanded its presence in enterprise messaging last week when it announced plans to buy SoftSwitch, Inc., a vendor of host- and server-based software that ties together disparate vendors' E-mail systems.

Officials from both companies said the deal, which involves a stock swap worth roughly $70 million, will lead to improved management and directory services for cc:Mail and Notes users at both the enterprise and departmental levels.

The acquisition also gives Lotus more ammunition in its battle against Microsoft Corp. in the messaging market — and comes just days before Microsoft officially unwraps its new enterprise messaging system. It could also strengthen Lotus' ability to offer public network-based messaging applications, such as those the company plans to offer with AT&T.



SoftSwitch will be folded into a new Lotus unit called the Inter-Enterprise Computing Group once the deal is complete. But efforts to fully integrate SoftSwitch's host-based Central and server-based Enterprise Messaging

See **Lotus**, *page 8*

Taking stock: Users get a sobering look at IT's future

IT User Summit guest list

- American Airlines, Inc.
- Barclays Network Services
- CH2M Hill
- Ciba Corning Diagnostics Corp.
- CIGNA
- Clorox Co.
- Cooper Industries
- Cooperative Systems
- The Dow Chemical Co.
- Electronic Data Systems Corp.
- Hewlett-Packard Co.
- ITT Hartford
- Medical Center of Delaware
- The Santa Cruz Operation, Inc.
- Seattle Public Schools
- SynOptics
- Tennessee Valley Authority
- The Travelers Corp.
- VeriFone
- Western Management Consultants

BY KEVIN FOGARTY

Boston

Executives from major corporations and user groups gathered here last week to examine ways to drive key business initiatives such as reengineering and keep their companies competitive into the next century.

The users defended and debated five scenarios describing varying roles of information technology (IT) departments in 1999. Ultimately, the process showed that users are in charge of their own destinies. By pushing for key events and technologies to emerge — such as cohesive data management architectures and better systems management products — they can steer their groups toward strategic goals.

At the two-day IT User Summit, cosponsored by Boston's Northeast Consulting Resources, Inc. and *Network World*, the users learned techniques that help enterprises chart long-term IT strategy and build consensus on the plan within their businesses.

To reach its conclusions, the group — which included IT executives from corporations such as American Airlines, Inc. and Dow Chemical Co. — used a technique developed by Northeast Consulting called Future Mapping.

Although it has been used for other vertical industries before, last week was the first time Future Mapping was employed to describe the role of the IT function and the value it contributes to the business, said Mary Johnston Turner, a principal at Northeast Consulting.

With Future Mapping, participants are asked to defend one of five scenarios, called end states. Each end state represents a different vision of what IT organizations will look like in 1999.

The benefits and drawbacks of each end state are debated and, ultimately, the group is asked to decide what mix of end states best describes the future for com-

See **IT future**, *page 68*

NetWare gets new host tools from Novell, Proginet

BY CARYN GILLOOLY

Uniondale, N.Y.

Novell, Inc. this week is expected to announce a deal with Proginet Corp. to jointly develop and sell a line of products that will let IBM mainframes handle chores usually performed by NetWare servers.

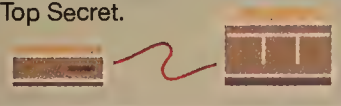
Highlighting the announcement will be software that gives mainframes support for Novell's Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) protocol. The companies will also detail plans to bring NetWare services — including directory, security and management — to the IBM MVS

See **NetWare**, *page 70*

Hosting NetWare

Novell and Proginet's plan for NetWare-to-mainframe integration

1. Proginet to take over development and marketing of the mainframe technology for Novell's Network Navigator software distribution product.
2. Novell and Proginet to release a product that will give MVS mainframes support for IPX/SPX.
3. The two companies will issue a product to synchronize NDS and mainframe-based security systems such as RACF and Computer Associates International, Inc.'s Top Secret.



GRAPHIC BY SUSAN SLATER

INSIDE FEATURES

A *Network World* poll of IS decision makers finds that modest budget increases are likely in 1995. But for many, the hikes in capital and operating expenses won't cover the hidden costs of client/server initiatives or make up for reductions in staff.

This year's Annual Budget Survey provides a window into the budget plans of more than 350 net managers. The story uncovers projected spending breakdowns for 1995 and looks at the techniques users employ to get around financial hurdles.

The Annual Budget Survey will let users users compare their budget wants and needs against those of users from a range of industries.

See page 51.

NEWSPAPER

Briefs

Ruining Microsoft's party. Microsoft Corp.'s electronic mail competitors were suspiciously active last week, just a week before Microsoft will treat its users to a preview of its new messaging products. Not only did Lotus Development Corp. announce that it is buying SoftSwitch, Inc. (see story, page 1), but IBM announced that it will resell Hewlett-Packard Co.'s OpenMail E-mail on RISC System/6000 servers. IBM will not be ready until later this year to announce when and for how much it will sell OpenMail, which is already available for the RS/6000 from HP.

Ray-tirement. Ramond Noorda, the man behind local-area network giant Novell, Inc., is expected to announce this week that he is retiring. Noorda stepped down as president and chief executive officer of Novell in April, when he named Robert Frankenberg as his replacement, but has remained chairman of the board. This week, Noorda is expected to step down from that position, as well, with Frankenberg as his successor. According to analysts, the change in power is expected to start a major restructuring within Novell.

MobileWare awareness. MobileWare Corp. in Dallas last week announced intelligent agent-based software for giving traveling users access to Novell, Inc. LANs via wireless or telephone links. The $279 MobileWare 1.0 package will run as a NetWare Loadable Module to allow users to work as if they were in their own offices.The software contains messaging and paging filters to notify users of urgent communications.

MobileWare: (214) 952-1200.

Legal maneuvers. Canter & Siegel, the Arizona immigration lawyers who earlier this year received national media attention for carpet-bombing Usenet conferences with advertisements, last week made good on their promise to do it again. But a Norwegian hacker quickly released a "spam" killer program that deleted most of the ads before users had a chance to see them. Meanwhile, the Internet Society announced plans to develop an Internet code of ethics to deal with situations like this.

Wireless win for Bells. The regional Bell holding companies' constant probing for ways to enter the long-distance business, short of federal legislation, took a new turn last week.

The Department of Justice said it would support the RBHCs' push to provide long-distance service with their wireless operations. The court administering the Modified Final Judgment frequently follows Justice Department recommendations.

Coming from Informix. Informix Software, Inc. will announce on July 11 a new front-end development tool designed to work with its own databases as well as those from Oracle Corp. and Sybase Inc., sources said. Codenamed 4GL++, the tool is scheduled to ship this fall. Sources described 4GL++ as an event-driven, object-oriented tool for building industrial-strength applications.

Kavner to depart AT&T. Ten-year AT&T veteran Robert Kavner plans on July 1 to join Creative Artists Agency in Los Angeles "to develop opportunities for the agency's clients in the digital interactive networked media," said a spokesman for Kavner's new company. Kavner, one of four AT&T executive vice presidents and currently chief executive of AT&T's multimedia group, had been mentioned as an eventual possible successor for AT&T Chairman Robert Allen.

Correction: *Network World* ran in its June 6 issue on page 2 what was believed to be a fictitious 800 number in a headline about new toll-free service options from Bell Atlantic Corp. That number is actually in service by another company and should not be used to reach Bell Atlantic. For more information on the Bell Atlantic services, call (703) 974-4507.

Contacts

ADDRESS: Network World, 161 Worcester Rd., Framingham, MA 01701. PHONE: (508) 875-6400; FAX: (508) 820-3467; INTERNET: network@world.std.com.; BBS: Interact with other readers: download free software, submit letters to the editor, leave news tips, change of address requests or hunt for jobs by using your IBM, Apple or other computer to dial into the BBS at speeds up to 9.6K bit/sec by dialing (508) 620-1178 or (508) 620-1160. READER ADVOCACY FORCE (R.A.F.) HOTLINE: Contact us with story tips about pressing user issues, (800) 622-1108, Ext. 487; NETWORK HELP DESK: Contact Dana Thorat via any of the above means.

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Internet tips...

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IBI set to ship EDA/SQL 3.0, which offers support for distributed databases. *Page 6.*

Oracle boosts Oracle7 with enhanced replication facilities, parallel processing abilities. *Page 6.*

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ENTERPRISE INTERNETS

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LOCAL NETWORKS

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Community hospital preps for LAN technology injection as it examines ATM and ISDN. *Page 25.*

3Com bolsters its top chassis hub lines with new routing and management capabilities. *Page 25.*

GLOBAL SERVICES

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Microsoft clarifies its new database direction with its next version of SQL Server. *Page 41.*

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Network HELP desk

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.*

Currently, we are working on purchasing equipment for an Asynchronous Transfer Mode (ATM) network. Do you know what the specifications are for the lengths and types of fiber cables (OC-3c, Transparent Asynchronous Transmitter/Receiver Interface —TAXI and Digital Service Level 3 — DL3)? Where can I get the User-to-Network Interface (UNI) spec?

Joseph Riolo, Rome, N.Y.

Ron Jeffries, principal of Jeffries Research in Santa Maria, Calif., and editor of the "ATM User" newsletter replies:

DS3, when used to transport ATM traffic, is specified for coaxial cable only. A maximum of 900 feet is allowed from customer premises equipment to the telephone company demarcation point (where the telephone company terminates its service).

TAXI (100M bit/sec ATM) requires 62.5/125-micron multimode fiber and allows a maximum distance of 2 kilometers between network nodes.

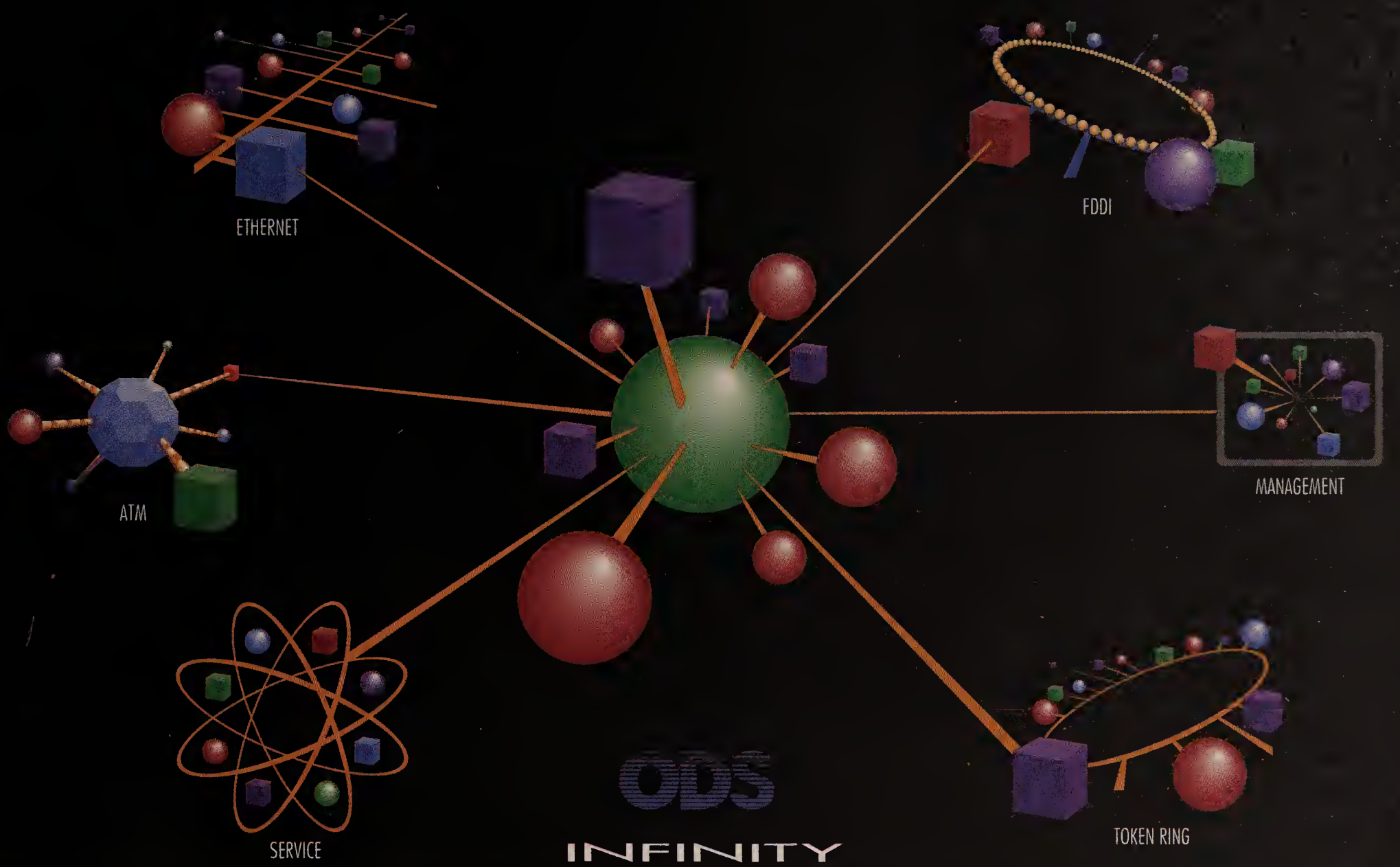
OC-3c (155M bit/sec ATM) carries the same specs as TAXI when running over multimode fiber. In addition, single-mode fiber is an option for OC-3 ATM. The internodal distances supported depend on implementation. There are two flavors of single-mode fiber: The long-reach version supports internodal distances of up to 40 kilometers. The intermediate reach version allows 17 to 18 kilometers between nodes.

The single-mode options are far more expensive than multimode fiber. On a per-port basis, intermediate-reach, single-mode fiber will probably cost the user at least $1,500 more than multimode; for long-reach, per-port costs can be $3,000 more than multimode.

According to the ATM Forum, users can obtain a copy of the ATM Forum 3.0 UNI by contacting Prentice Hall, Inc. at (515) 284-6751 or place an order via the Internet at ftp.prenhall.com.

Our company has a couple of Macintosh users in our otherwise personal computer Novell, Inc.

See **Help desk**, *page 54*



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Sprint to gain int'l visibility via deal with European carriers

BY DAVID ROHDE

Kansas City, Mo.

Sprint Corp. hasn't exactly been on Reuben Lantto's radar screen. Until last week, that is.

The director of international telecommunications for Minneapolis-based Cargill, Inc. — America's biggest privately held company — deals almost exclusively with AT&T and MCI Communications Corp. for the circuits that tie together his far-flung global net.

"I can't remember the last time Sprint tried to sell me an international circuit," he said.

But Lantto took notice when Sprint announced that — together with Deutsche Bundespost (DBP) Telekom and France Telecom — it would form a new operating company to help big users build global nets that reach not only into Germany and France, but into other European countries, as well.

In fact, the alliance, which calls for the German and French carriers to invest $4.2 billion for a 20% stake in the No. 3 U.S. carrier, promises to bring competition to almost all points of the globe *other* than France and Germany.

Under the arrangement, France Telecom will be the sole partner operating in France and DBP Telekom the sole partner operating in Germany.

But the new, as yet unnamed operating company will compete for business in European countries other than France and Germany.

And a second new operating firm will compete for business in non-European countries (see graphic).

Spanning the globe

Sprint, DBP Telekom and France Telecom will team to provide voice and data services around the world as follows:

Location	Carrier
U.S.	Sprint
Germany	DBP Telekom
France	France Telecom
The rest of Europe	European operating company owned 33% each by Sprint, DBP Telekom and France Telecom.
All other countries outside the U.S. and Europe	Worldwide operating company owned 50% by Sprint and 50% by France Telecom and DBP Telekom.

The scheme drew howls of protest from AT&T, which asked the U.S. government to withhold approval of the deal.

"There's something very wrong when telephone companies like the [France Telecom and DBP Telekom] monopolies can buy into the U.S. telecommunications market while keeping their home markets closed tighter than a drum," said AT&T in a prepared statement.

See **Sprint**, *page 67*

IBM creates new division for apps-based services

Big Blue also reaffirms its DCE plans.

BY MICHAEL COONEY AND JIM DUFFY

New York

IBM last week announced the creation of a new division devoted to developing network-based applications for the emerging Information Superhighway.

Separately, the firm reiterated its plans to add the Open Software Foundation, Inc.'s (OSF) Distributed Computing Environment (DCE) technology across its hardware platforms.

IBM's new division, dubbed Networked Application Services, brings many of the company's previously disparate application-related technologies — including multimeda, Internet services and videoconferencing — together under one banner. The new group will address the application service needs of users in the commercial and consumer markets.

The division will offer a wide array of applications and services — from video on demand to electronic publishing. Services will be available over such IBM entities as Prodigy and Advantis, the company's videotext and value-added network, respectively.

Analysts said that while the direction of the division is a little cloudy right now, its long-term strategy is to establish IBM as a significant player in the development of network applications and services for users of large public networks.

IBM isn't alone in targeting these users with new net-based applications. AT&T has recently formed alliances with Novell, Inc. and Lotus Development Corp. to provide similar services.

"IBM wants to shift its core businesses from being hardware-centric to being network delivery-centric, and this group has the broad mandate to pull that off," said Sam Albert, president of the Albert Associates, Inc. consultancy in Scarsdale, N.Y.

"The areas covered by this division are some of the areas IBM Chairman Lou Gerstner has targeted as being key to future IBM success," he said.

Tom Nolle, president of the CIMI Corp. consultancy in Voorhees, N.J., said the new IBM group contains "a muddy mix of technologies, but taken together, they are clearly high-profile areas IBM would like to be a leader in."

DCE DECISIONS

Separately, IBM said it is on track to deliver key components of its DCE strategy later this year. DCE is the OSF's technology for letting applications communicate across multivendor systems.

Art Olbert, director of IBM LAN Systems, said the company is developing DCE extensions to Novell's NetWare 3 and 4 local-area net operating systems and Lotus' Notes groupware product. The firm will add DCE directory, security and distributed application development enhancements to NetWare in about a year, he said.

Meanwhile, IBM is working with some of its customers to link Notes directory, security and remote procedure call capabilities to similar DCE functions. IBM will complete the Notes projects "within a quarter or so," Olbert said, and then will "tune and extend" them to make them more generally available.

IBM also said it is on target to deliver DCE components across all of its hardware platforms. For example, IBM said it would announce in September MVS mainframe-based DCE server functions that will let DCE users access existing CICS and IMS applications from anywhere in the enterprise (*NW*, March 7, page 1).

"Our plans are in place, and later, users will see the rollout of DCE across our product line," said Pete Beggs, DCE planning manager for IBM.

FAST-PACKET NETWORKING

NTI makes its move to control ATM congestion

BY DAVID ROHDE AND JOANIE WEXLER

McLean, Va.

Northern Telecom, Inc. (NTI) is planning enhancements that will enable its ATM switch to better handle congestion control, a move that promises both to improve public ATM net performance and boost NTI's chances for providing MCI Communications Corp.'s long-sought ATM platform.

This fall NTI will raise the number of 53-byte Asynchronous Transfer Mode cells that can be held in its Magellan Gateway central office switch buffer from 200 to 4,000, said Dave Ramos, assistant vice president for broadband multimedia networks.

The enhancement addresses one piece of the puzzle in controlling congestion in ATM networks that support multiple traffic types with varying tolerances for delay.

NTI's disclosure of its Magellan plans comes on the heels of a move by GTE Government Systems Corp. to add a buffer of up to 8,000 cells for variable bit rate (VBR) traffic to its ATM switch designed for military applications (*NW*, June 13, page 8).

NTI's Gateway has the same hardware platform as GTE's ATM switch, although the GTE switch has additional security features. NTI chose the 4,000-cell buffer because that is the level MCI requested, Ramos said.

MCI, which has long been in search of a platform for its as yet unannounced ATM service, is using the existing Gateway switches in a six-city trial of a public ATM network (*NW*, May 9, page 3).

But MCI officials have often talked of the need for deeper buffers to handle a mix of constant bit rate traffic — such as voice and video — and VBR traffic such as bursty TCP/IP data (*NW*, April 18, page 4).

Stephen Von Rump, MCI's ATM product manager, said that buffer depth is important but "the ability of a switch to support all classes of ATM service and a buffer management scheme for controlling data flow and quality of service across the network are all required."

He said NTI's original buffering mechanism "didn't meet our requirements in the lab or in customer trials."

Von Rump said MCI will announce its ATM switch platform by the end of the summer, but the carrier did not indicate whether NTI's planned enhancement puts the company ahead in the race.

To date, many central office ATM switches have had shallow buffers because early ATM users have been using the network in a way that mimics leased lines. Users specify a maximum bandwidth they will use, and the carrier can more easily manage capacity use, noted Ron Jeffries, an ATM Forum member and principal at Jeffries Research, a consultancy in Santa Maria, Calif.

For handling mixed traffic over ATM, two congestion management schemes are under review by the ATM Forum.

One, a credit-based scheme, would allot a customer a maximum amount of bandwidth, after which the network would accept no more traffic. The other, a rate-based scheme, allows all traffic into the network but sends a message to the originating equipment to slow down if it detects congestion.

Observers agreed that deep buffering is only one of several ways to address the problem of packet loss. The Globeview 2000 switch AT&T has under construction is designed around a rate-based scheme that lets all ports share a common 20G-bit buffer pool, said Brian Dunlap, AT&T ATM marketing director.

Instead of a dedicated buffer per port with a fixed size, virtual buffers at each port dynamically adjust to the size needed "so there is no overload or dropping of cells," he said.

"We're working right now with the switch manufacturers to look at this," said Tim Kelley, a network engineer for Sprint Corp. in Overland Park, Kan. Sprint uses ATM switches from TRW, Inc. and NEC America, Inc.

INTERNET *tip*

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

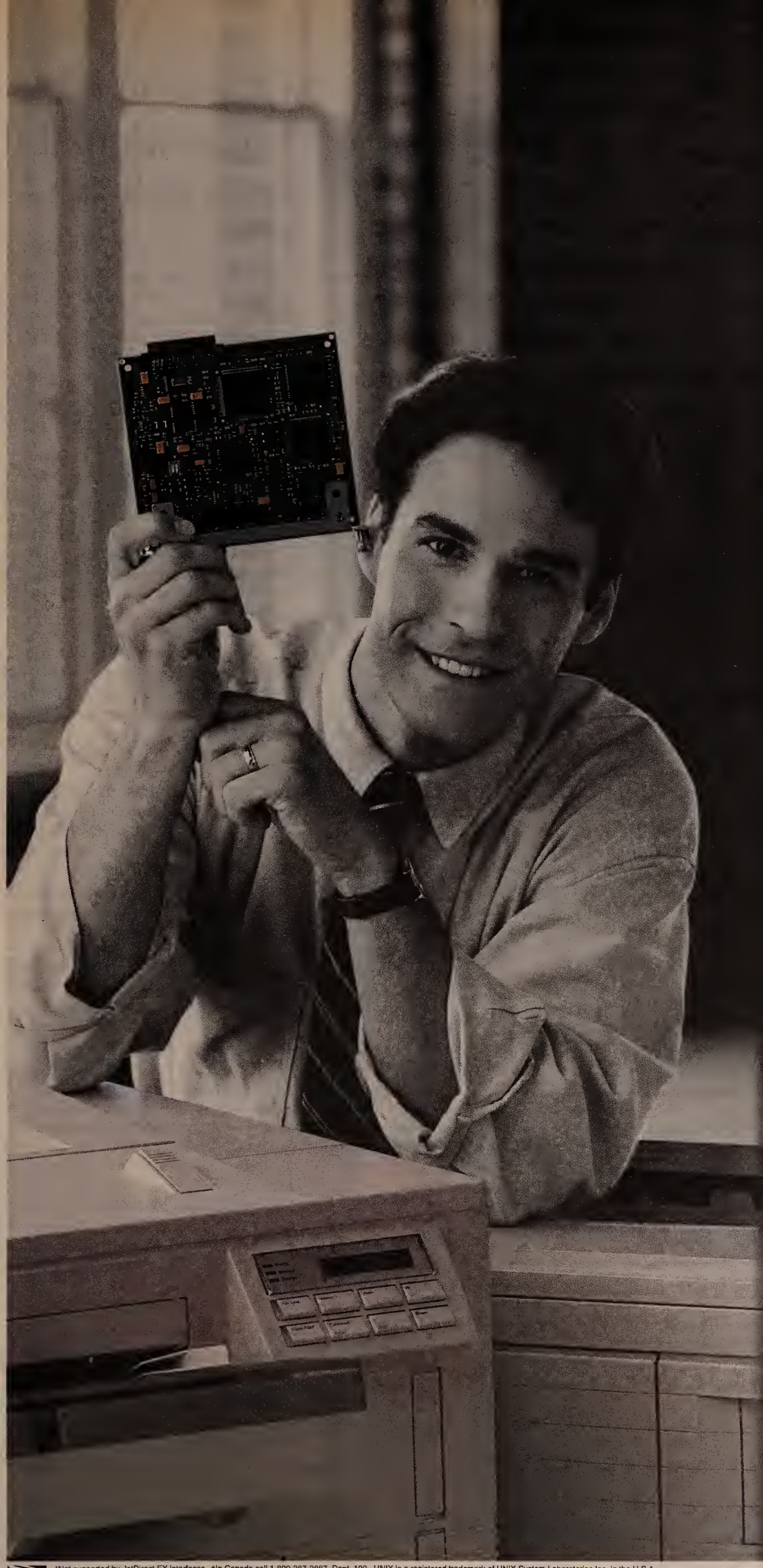
NII

The Information Infrastructure Task Force, comprising representatives from large federal agencies, maintains a Gopher site about planning for the National Information Infrastructure (NII). Resources include:

- ✔ **Copies of documents and speeches related to the NII**
- ✔ **A calendar of events**
- ✔ **Minutes of task force meetings**
- ✔ **Contact information**

To access: Use Gopher to connect to iitf.doc.gov.

Gaffin can be reached via the Internet at agaffin@world.std.com.



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AT&T preps service for video on demand

BY JOANIE WEXLER

New York

Business users are poised to finally gain video dial tone — a move that will let them conduct on-demand multimedia conferences, AT&T said last week.

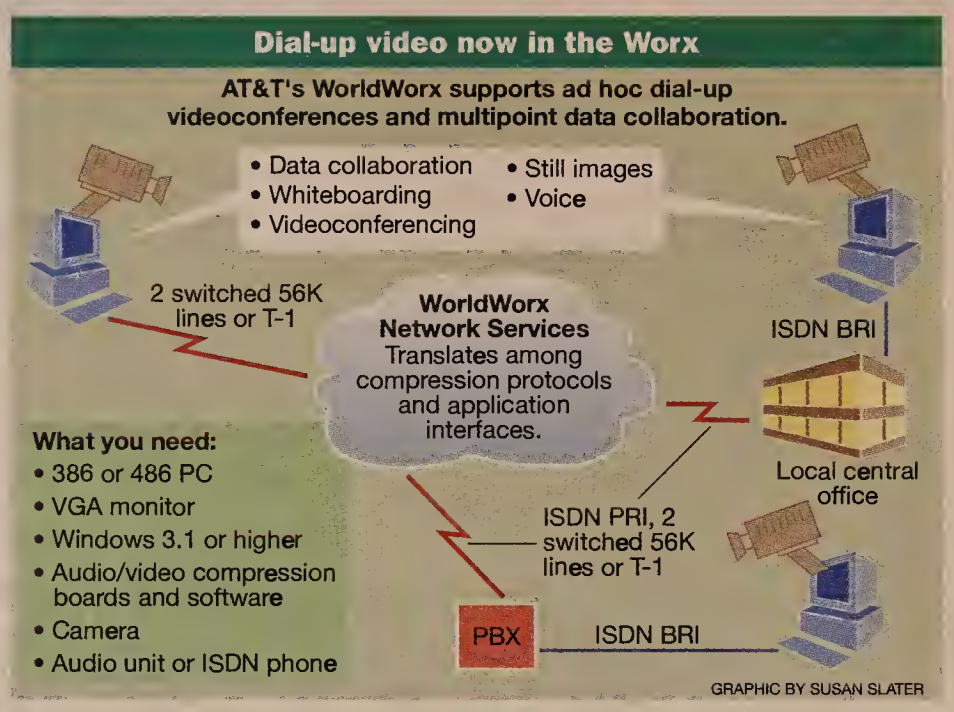
The carrier unveiled WorldWorx Network Services, designed to let users dial up full-motion videoconferences and real-time collaborative data sessions among multiple colleagues and business partners without preplanning their meetings.

WorldWorx, to go live in the first quarter of next year, will provide interoperability among different vendors' videoconferencing products and allow real-time collaboration on applications such as spreadsheets.

That kind of ad hoc connectivity is important to construction equipment maker Caterpillar, Inc. in Peoria, Ill. "We look forward to the interoperability because we have no control over what [conferencing] products other companies buy," said Kristi Moushon, a product manager at Caterpillar.

Caterpillar is using videoconferencing to let its dealers and Caterpillar employee jointly examine damaged equipment parts and determine if they are covered by warranty.

WorldWorx applies both to room systems and desktop computers outfitted with videoconferencing boards, software and cameras in companies that subscribe to Switched 56K, Integrated Services Digital Network or T-1 services (see graphic).



While AT&T has not set service prices, Carl Pavarini, vice president of emerging markets, said, "Fifty cents to $1.50 per minute would be in the ballpark."

Through partnerships with key desktop equipment and software vendors — such as Apple Computer, Inc., IBM, Lotus Development Corp., Novell, Inc., PictureTel Corp., Sun Microsystems, Inc. and Xerox Corp. — AT&T will provide translation services among compression technologies. AT&T will use a multipoint bridge from partner VideoServer, Inc. to tie together both room- and desktop-based systems.

AT&T and its partners are also creating one directory for all applications running on AT&T's network, such as Network Notes, NetWare Connect Services and WorldWorx, said Ernie DeNigris, AT&T vice president of collaborative video applications. This will let users look up partners for video and other collaborative conferences the way they locate telephone numbers in the phone book.

STUMBLING BLOCKS

Elliot Gold, videoconferencing consultant and president of Telespan Publishing Corp. in Altadena, Calif., said AT&T's goal is to eliminate as many user obstacles to conducting videoconferences on demand.

To date, he said, the concept of video dial tone has been largely restricted to the cable television company definition, where users call the cable company and it broadcasts a requested movie to them.

Users can collaborate via video over the public network today, but typically must do so on a point-to-point basis and set up meetings well ahead of time, DeNigris said.

And while many vendors' products adhere to the H.320 standard for video compression, there are no standards in place for data collaboration, which would let users call up a document and work on it together in real time.

At Warner-Lambert, Inc., a pharmaceuticals firm in Morris Plains, N.J., "when we deal with our ad agencies, they don't have the same products that we do," said Dominic Zampella, manager of net operations.

He said the H.320 video compression standard allows the company to conduct videoconferences despite the equipment disparities.

"But we haven't tried to use collaborative applications be-tween dissimilar units," Zampella said. AT&T's service could expand Warner-Lambert's ability to work more closely with its business partners.

AT&T's WorldWorx partners could help give conferencing the visibility it needs to become widespread, said Ed Leer, director of corporate electronic communications at health care administrative firm AdminaStar, Inc. in Indianapolis.

"Any new technology that changes the way you interact requires market penetration to get people to use it," he said.

MIDDLEWARE

IBI to ship faster EDA/SQL

BY BARB COLE

New York

Information Builders, Inc. (IBI) next week will ship a faster version of its Enterprise Data Access (EDA)/SQL middleware that supports distributed databases and more data access standards, as well as a new pay-for-what-you-use pricing scheme.

EDA/SQL is middleware that lets front-end applications access data on more than 35 platforms.

Release 3.0 includes Hub Manager, which lets users access data stored in multiple databases on multiple operating systems from client applications.

"Hub Manager provides the illusion that the user is working with one big database," said Jon Deutsch, technical director of marketing at IBI. Hub Manager is installed on a server and routes data requests from clients to data sources.

Clients will not have to load different networking protocols to get to different data sources. Additionally, clients will no longer have to log in and out of each database they are accessing. Hub Manager handles connections to the back-end data sources and IDs, too.

Release 3.0 is faster than its predecessor because Hub Manager joins tables when clients request data from multiple data sources. In the past, host data was passed to clients, where the joins were done.

Initially, Hub Manager will run on IBM MVS and OS/2, Hewlett-Packard Co. HP-UX servers and DOS, OS/2 Windows, Windows NT and Unix clients. Each Hub Manager serves multiple clients, but the number varies depending on the platform.

Another change in Release 3.0 is that customers can buy only the EDA/SQL services that they need.

Pricing information was not available, but users were encouraged by a modular approach and said it would probably be more cost-effective.

This modular approach will also affect performance, the company said. Users will not have extra layers of EDA/SQL on machines they are not using.

In Release 3.0, users will be able to access data stored in IBM's Information Management System and CICS mainframe systems via a middleware layer that will reside on each client machine. The new release also supports the SQL Access Group's Call-Level Interface, the Open Software Foundation, Inc.'s Distributed Computing Environment, Sybase, Inc. and Microsoft Corp.'s db-Lib and IBM's DRDA.

Release 3.0 has a data management tool that lets tables with dissimilar data formatting be joined. "Now, we do an intermediate step to join two dissimilar tables, so this feature will be extremely useful," said Riccardo Bartra, end-user computing manager at Alamo Community College in San Antonio, Texas.

As it makes Release 3.0 available, IBI will announce EDA/SQL Version 3.1 and 3.2, both of which will ship by year end. Release 3.1 and 3.2 will essentially roll out Release 3.0 on additional platforms.

✆IBI: (212) 736-4433.

Oracle to offer replication ability with Release 7.1

BY BARB COLE

Redwood Shores, Calif.

Oracle Corp. this week will begin shipping Oracle7 Release 7.1 with enhanced replication facilities, which are vital to distributed database applications, and parallel processing capabilities that boost performance of the widely used database.

Replication is a way of copying data from one server to another. Oracle7 offered "snapshot" replication, which let users copy one table at a time from a primary server to another server.

The new release supports so-called group snapshots, which involves replicating a number of tables simultaneously, sources said. This improves data integrity since tables in the group snapshot are protected from user updates during replication.

"This is significant because it will guarantee consistency across multiple tables," said Robert Bolt, president of Database Server Systems, a database consultancy in South San Francisco, Calif., who has worked with the beta version of Release 7.1.

"Oracle's replication capabilities cover all the ways that users want to distribute their data today and should be viewed as a strong competitor to Sybase," said Peter Kastner, vice president of Aberdeen Group, Inc. in Boston.

FULL FUNCTIONALITY

Release 7.1 provides full parallel functionality, including query, loading, indexing, backup and recovery, the company said. This enables users to access information up to 1,000 times faster than they could with Oracle7, according to the company. In addition, the performance of distributed applications should be improved since the database can now parcel out tasks among multiple processors.

"It is incredibly fast," Bolt said.

Beta-testers said the parallel processing capabilities also boost Release 7.1's ability to handle large databases. "[Release] 7.1 can handle extremely large databases on popular symmetric multiprocessing machines," said Dewey Allen, national director of advanced software engineering at Price Waterhouse in Bethesda, Md. That makes Release 7.1 a viable alternative to mainframe databases, he said.

Oracle is also expected to announce the availability of SQLNet 2.1 this week, the next release of the company's middleware that enables applications to access Oracle databases on multiple machines.

"The most notable feature of SQLNet 2.1 is that it is now compatible with Microsoft Corp.'s LAN Manager and IBM's DRDA," said Shaku Atre, president of Atre Associates, Inc., a consultancy in Port Chester, N.Y.

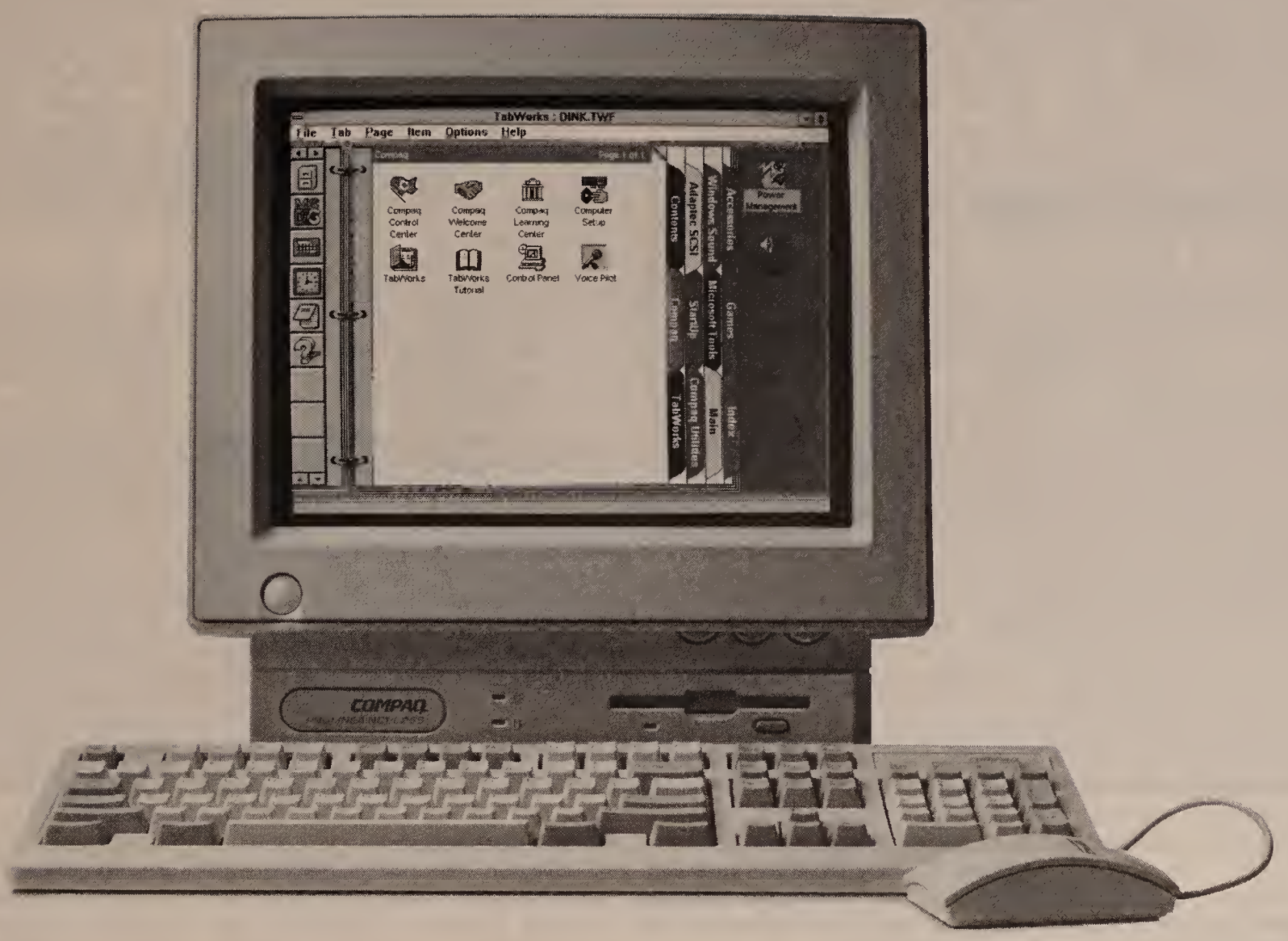
✆Oracle: (415) 506-7000.

CORRECTIONS

The price of Locus Computing Corp.'s new PC-Interface Plus 2.0, a gateway tool for PC-to-Unix connectivity, was given incorrectly last week. The real price is $449. Contact Product Marketing Manager Dennis Bordelon at (310) 337-5235 for more information.

A referral phone number for Belgacom on page 34 of the June 6 issue was incorrect. Belgacom can be reached at (203) 221-5260.

A story on page 1 of the May 30 issue incorrectly stated that IBM's APPN Topology and Accounting Manager software would ship by year end. In fact, it is already available.



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APPN technology passes initial performance tests

Findings show some tuning may be required.

BY MICHAEL COONEY

Boston

Test results to be released at the APPN Implementors Workshop here next week will show that routers configured as APPN Network Nodes (NN) can achieve fast throughput, provided that the vendor and its customers are willing to invest in tuning for performance.

The test was conducted by The Tolly Group of Manasquan, N.J. for 3Com Corp. on its NetBuilder II implementation of Advanced Peer-to-Peer Networking NN. APPN is an emerging IBM technology that supports peer links among devices in an enterprise network. NNs are the central components in an APPN network, handling directory and routing functions, and NN performance will be one of the key concerns for users.

"These test results demonstrate NNs do work and that they can perform well under heavy loads," said Kevin Tolly, president of The Tolly Group.

"For 3Com's implementation, the results show they have a solid APPN implementation, and it should only get better as they continue to work on it," he added.

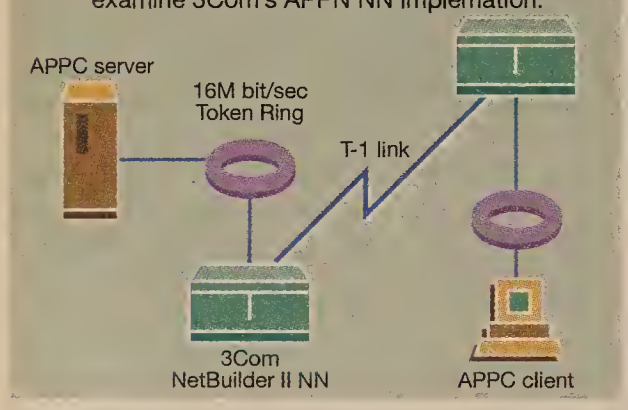
Dave Bryant, 3Com's director of network technology, said performance improved by a factor of four after 3Com tuned its NetBuilder II router, for example.

"When we first tested it at the Tolly lab, the results were lean to say the least," Bryant said. "We expect other vendors will have similar performance problems, but that they will also be able to tune their software."

3Com APPN router test . . .

— Figure 1 —

The Tolly Group used this test bed to examine 3Com's APPN NN implemation.



REROUTING DATA

According to Bryant, 3Com revamped the way APPN data flows through NetBuilder II's buffers and tweaked some of the dynamic windowing capabilities, which also control data flow, to improve throughput.

"We expect that by the time this software ships later this year, performance will be even better than it is now," Bryant said.

He added that users will have to keep things pretty finely tuned, as well.

The Tolly Group test bed consisted of two 16M bit/sec Token-Ring local-area networks linked by 3Com routers across a T-1 link.

An OS/2-based personal computer running an Advanced Program-to-Program Communications application resided on each LAN — one configured as a server, the other as a client.

MEASURING THROUGHPUT

The test measured throughput between two 3Com NetBuilder II routers configured as NNs at either end of a T-1 link. Throughput was determined using Systems Network Architecture message units known as Request/Receive units (RU) measuring between 512 bytes and 4,096 bytes. With these RU sizes, the routers produced throughput ranging from .967M to 1.457M bit/sec (see Figure 2).

The Tolly Group test adds to the early performance information generated last year by APPN user Providence Life & Accident Insurance Co.

The firm averaged from 10M to 12M bit/sec throughput between PCs on a 16M bit/sec Token Ring.

"We have demonstrated we can move large amounts of data quickly between Network Nodes," said Gerry Williamson, information systems operations director. The firm expects to have a 1,400-node APPN net by the end of the year.

Tolly used a second test bed to verify interoperability between the 3Com router and an IBM OS/2-based NN and found no problems. That jives with 3Com's internal testing, according to Bryant.

INTEROPERABILITY CONCERNS

But, he added, what vendors and users should be concerned with is interoperability at the mainframe level because of the complexity of APPN on the host.

Analysts agreed that will be a challenge. But many APPN nets will evolve without the mainframe, so interoperability with OS/2 NNs, for example, will be more important in the short term.

"The test results are interesting, but what they really prove is that 3Com is now ahead of the big boys, like Cisco and Wellfleet, in the IBM internetworking world," said Anura Guruge, an independent analyst based in New Ipswich, N.H.

. . . yields solid performance

— Figure 2 —

Packet size (in RUs)	Throughput
512	.967 M bit/sec
1,024	1.031 M bit/sec
2,048	1.139 M bit/sec
4,096	1.457 M bit/sec

Tolly agreed, saying that since the 3Com APPN NN implementation was up and running, the firm is now almost 1 1/2 years ahead of the competition.

"Because 3Com was one of the early licensees of NN — Cisco Systems, Inc. and Network Equipment Technologies, Inc. were the others — they are now out of the chute much earlier than Cisco and Wellfleet," Tolly said.

What they bring to the table

Lotus	
1993 revenue:	$988 million
Primary products:	Notes groupware, cc:Mail and desktop applications
Employees:	4,099
SoftSwitch	
1993 revenue:	$35 million
Primary products:	Central (host-based) and EMX (server-based) message switches
Employees:	210

Lotus

Continued from page 1

Exchange (EMX) message switches with Lotus electronic mail and groupware products could take as long as two years, company officials and analysts said.

In the short term, users mainly gain one-stop shopping for enterprise messaging products, said Heidi Dix, an analyst at the consulting firm Forrester Research, Inc., based here.

SoftSwitch users may also see improved service and support, thanks to the more plentiful resources of Lotus and the creation of a customer service group with knowledge of both products, some users said.

Rick Kirkland, senior computer analyst for South Carolina Electric & Gas, Inc. in Columbia, S.C., called the deal "a much welcomed surprise."

He is looking forward to the ability to make just one call when problems arise with his E-mail system, which uses SoftSwitch Central to connect 1,300 cc:Mail users with roughly 3,700 other E-mail users.

SoftSwitch has had a reputation as an objective supplier of software for stitching together disparate E-mail systems since introducing its original product, Central.

In 1992, SoftSwitch released its Unix-based EMX switch that provides many of the same functions. Grabbing these tools will give Lotus a new way to convince skeptical MIS directors it can support their heterogeneous messaging environments.

SoftSwitch, which barely broke even last year on sales of about $35 million, also has much experience building large E-mail directories and selling its systems for use in public value-added networks. This could help Lotus create global public Notes nets similar to the one it is now building with AT&T, said Jim Manzi, Lotus' president and chief executive officer.

Officials from the two companies last week offered few specifics about exactly how they would integrate Lotus' Notes, cc:Mail and upcoming Lotus Communications Server (LCS) with SoftSwitch's products, particularly EMX.

LCS is being designed to work with the next generation of Notes and cc:Mail client software and provide tight integration between the them.

Manzi said Lotus is continuing to push to get LCS out the door by the middle of next year, which will likely mean little work to integrate SoftSwitch technology into it in the near term.

However, Lotus could fold SoftSwitch's Simple Mail Transfer Protocol message transfer agent technology into LCS, he said.

SoftSwitch President Michael Zisman, who becomes a Lotus vice president of the new interenterprise group, said Lotus would continue to push EMX as an open platform for enterprise messaging. But some observers are skeptical.

Sara Radicati, president of the Radicati Group, a San Francisco E-mail consulting firm, predicted EMX would ultimately be tied so closely to other Lotus products that third-party vendors would begin to have difficulty in integrating EMX with their offerings.

CyberSpeak: *Voices from the reader network*

IBM is betting its networking future on Advanced Peer-to-Peer Networking. Are you?

"We are heavily involved with implementing APPN. Whether we're betting our future on it or not is still up in the air. What will happen tomorrow or what technology may be delivered or introduced tomorrow could change our current plan."

Brian Spears, manager of information technology, Konica Business Machines USA, Inc., Windsor, Conn.

"APPN is of significant interest to this shop. We need to communicate to different types of machines and platforms within our shop, and peer-to-peer communication is important. It makes it a little more flexible, in my opinion."

John McGinnis, manager of information services, Functional Products Group, Henkel Corp., Kankakee, Ill.

"There are problems with APPN currently. For example, it does not have dynamic rerouting, and it could use improved data flow control. But IBM will improve it by introducing [High Performance Routing]. Improved APPN alone is no redemption. If IBM can develop a scheme where APPN, [Asynchronous Transfer Mode] and TCP/IP can work together in a multiprotocol and multivendor environment, APPN will be widely accepted."

Maneesh Naganand, software engineer, Ilex Systems, Shrewsbury, N.J.

NextWeek CyberSpeak Out!

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Comments?

See "Contacts" box on page 2.

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AT&T

Windows-based NetView platform on tap from IBM

BY MICHAEL COONEY

Boston

IBM this week will announce NetView for Windows, a lower cost, SNMP-based alternative to NetView/6000 for managing small to midsize networks.

The new package will let users manage hubs, routers, bridges, switches and other Simple Network Management Protocol devices from a Windows-based workstation. The software will let users collect topology and network status data from SNMP agents residing on the devices and issue commands back to the devices if necessary.

Topology and network status can be displayed on the management console in five colors, allowing users to point and click on any device to obtain more information about its location and the nature of any problems with it. An integrated trouble-ticketing feature allows users to track the problem type, who was contacted to fix it and the type of action taken to fix it.

"NetView for Windows is an alternative for users who don't need a full-blown NetView/6000 platform but who need to gain control over a smaller distributed LAN environment," said an IBM spokeswoman.

IBM stressed that NetView for Windows is not a downsized version of IBM's NetView/6000 enterprise SNMP management platform.

Rather, it is built on new IBM code and technology licensed by IBM from Network Managers, Inc., a net management software vendor in Chelmsford, Mass. Network Managers' software provides capabilities for monitoring non-IBM SNMP devices.

The platform also uses a DB Vista database from Relay Technology, Inc. to collect and store SNMP data.

While the new software has many capabilities, it cannot pass management information or alert traps onto a centralized NetView/6000 manager," according to the company spokeswoman. "We will explore that option in the future."

Also, the product is not designed to pass on information to other higher end management systems, according to IBM. Still, users said the software could complement installed enterprise network management platforms.

"NetView for Windows sounds like it could give us a better handle on some of our workgroup environments," said David Rogers, manager of network design with Kraft General Foods in Montreal.

It should give workgroup net managers control over their domains that they do not have today, he said.

NetView for Windows will be available July 29 for $1,895.

✆IBM: (919) 543-3937.

Hard targets

IBM is taking on HP's OpenView for Windows and Novell's NetWare Management System with its NetView for Windows, analysts said. The key differentiator for IBM is that its software has an integrated trouble-ticket feature.

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INTERNET tip

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

Breaking Tessera

Matt Blaze, the AT&T researcher who recently reported on a possible method for avoiding government decryption of messages encrypted with the Tessera card, has made a preliminary copy of his paper on the subject available over the Internet.

To access: Use anonymous ftp to connect to research.att.com. Use the cd command to switch to the dist/mab directory and get the file eesproto.ps. The file is in Postscript format.

Gaffin can be reached via the Internet at agaffin@world.std.com.

ENTERPRISE INTERNETS

Data Network Architectures, Standards, Equipment and Management

DECNET

Coordination can make move from Phase IV simple

BY JIM DUFFY

Didcot, England

Users making the transition from Digital Equipment Corp.'s DECnet Phase IV to DECnet/OSI could learn a few things from the U.K. subnet of the worldwide High Energy Physics network (HEPnet).

Faced with the traditional Phase IV problem of limited address space as well as an increasing requirement for multivendor networking, the U.K. HEPnet started planning its migration to DECnet/OSI in 1989. But in evaluating its migration, the U.K. HEPnet staff noted two areas beyond addressing that required attention: network naming and routing.

HEPnet is a particle physics research network based on a DECnet Phase IV backbone. It connects research facilities in the U.S., the U.K., France, Italy, Japan, Switzerland and other countries.

Thinking ahead

HEPnet's transition to DECnet/OSI involved...

- 4 years of up-front planning
- 2 years of operating a pilot project
- Coordination at many levels – worldwide, European and national
- Working closely with Digital

The U.K. portion of HEPnet, which recently completed its migration to DECnet/OSI, supports 1,200 nodes in 25 sites.

The U.K. HEPnet ran a pilot project for two years, coordinating activities with other HEPnet subnets and with Digital, and actually started the transition in January 1993, said David Kelsey, U.K. HEPnet DECnet Manager at the Appleton Laboratory in Rutherford, England.

HEPnet staffers commenced the transition to DECnet/OSI by first tackling network naming because they had to implement Digital's Distributed Name Service (DECdns). The DECdns approach to naming DECnet nodes is different than the local naming method they were accustomed to with Phase IV.

With DECdns, node name and address directories and translation tables are distributed among servers in the DECnet/OSI network. Local naming stores those tables locally.

One of the key features of DECdns is autoregistration; when DECnet/OSI nodes are added to the network, they automatically register themselves with the nearest DECdns server.

But U.K. HEPnet opted not to employ this feature, Kelsey said. The reason: U.K. HEPnet already has registration tools that not only include information on the DECnet/OSI node, but other information as well, such as the name and telephone numbers of primary and backup systems managers.

"Whenever a new node came into our network, we wanted to be able to register all of that information, and not just its address and name," Kelsey said. "Autoregistration would not have given us that information."

For addressing, meanwhile, the U.K. HEPnet had to reallocate Phase IV address bits so DECnet/OSI addresses could conform to the International Stan-

See **Phase IV**, *page 18*

IBM boosts multiprotocol software family

BY MICHAEL COONEY

Boston

IBM this week is expected to expand the scope of its AnyNet mutiprotocol connectivity software with support for new features and platforms.

AnyNet is a suite of software products that implements IBM's Multiprotocol Transport Networking (MPTN) technology, which lets applications communicate over any underlying net protocol without modification.

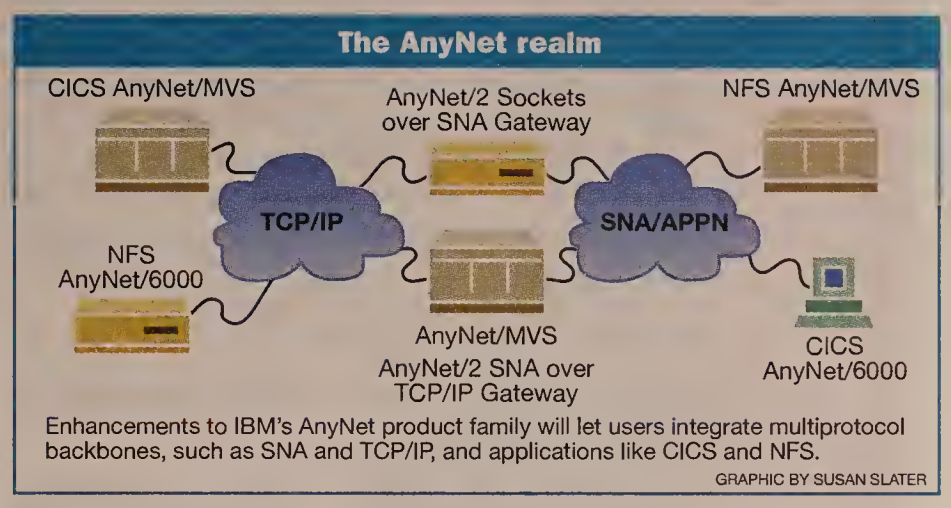
As expected, IBM will add AnyNet capabilities to the next VTAM release, which will simplify personal computer-to-host connectivity, and make it easier for local nets to communicate over IBM nets via a new Network Basic I/O System Extended User Interface (NETBEUI)-over-Systems Network Architecture feature.

IBM will also revamp its AnyNet/2 Sockets over SNA Gateway to provide new connectivity options (*NW*, Jan. 16, page 16).

"With this announcement, we now have the tools to tie together all of the components in the enterprise that could never easily communicate before," said James Neiser, director of marketing for IBM's networking products. "AnyNet can help users consolidate and simplify their multiprotocol networks while extending the reach of existing applications."

VTAM 4.2 support is a key piece of IBM's AnyNet strategy. With AnyNet deployed on the mainframe, users can link SNA 3270 devices or PCs supporting LU 6.2 to mainframe resources over Transmission Control Protocol/Internet Protocol nets without having to add new emulators or change the applications on the mainframe. VTAM controls the communication flow in and out of SNA

See **IBM**, *page 18*



Enhancements to IBM's AnyNet product family will let users integrate multiprotocol backbones, such as SNA and TCP/IP, and applications like CICS and NFS.

GRAPHIC BY SUSAN SLATER

MOSPF: Bringing multicast to commercial TCP/IP nets

BY JOHN MOY

Thanks to the emergence of switch-based nets and Asynchronous Transfer Mode's pending arrival in the mainstream, multimedia and videoconferencing applications are getting a close look from users.

Invariably, these applications require the ability to multicast packets across the entire enterprise in a timely and efficient way.

While traditional routing algorithms have struggled with this problem, the Multicast Open Shortest Path First (MOSPF) protocol has been designed with this task in mind.

MOSPF, a series of extensions to the existing OSPF protocol, was developed by the Internet Engineering Task Force (IETF) to enable Internet Protocol routers to forward multicast packets. That means an application can send a single message and have it delivered to multiple recipients, even if the recipients belong to separate IP network segments.

The IETF has designated MOSPF as a proposed standard, and the MOSPF specification has been published as the Internet's Request for Comment 1584.

MOSPF is well-suited for a number of net applications, including multisite videoconferences and commercially distributed databases in financial environments, where stock quotations generated in a central location are delivered to many traders.

To conserve bandwidth, MOSPF postpones packet replication and restricts the multicast packets to only active recipients. This helps it prevent problems analogous to when bandwidth-hungry Network Basic I/O System traffic is extended to an internet.

Packetized video is a perfect application for multicast. In a packet-based videoconference, an image of the local site is continuously digitized, compressed and sent to all remote sites. Even when compressed, the amount of data can be considerable, with a typical conference site generating about 128K bit/sec of traffic.

In such a situation, MOSPF can keep the amount of data traversing network links to a

See **MOSPF**, *page 20*

BRIEFS

SunSoft, Inc. last week announced a version of its **SunNet Manager** net management software for Solaris 1.X users.

SunNet Manager 2.2.1 includes the same features currently available on SunNet Manager 2.2 for Solaris 2. They include installation, discovery and configuration enhancements and support for Version 2 of the Simple Network Management Protocol.

SunNet Manager 2.2.1 costs $4,995 and is available now. Existing SunNet Manager users can upgrade to Version 2.2.1 and 2.2 for $1,998, SunSoft said.

SunSoft: (415) 960-3200.

Digital Communications Associates, Inc. (DCA) last week brought out a new version of its **CrossTalk for Windows** communications software that provides integrated facsimile and Internet access capabilities for local and remote users.

CrossTalk for Windows 2.2 now includes a graphical Internet Helper that delivers point-and-click navigation via the Internet. Users of 2.2 can also run CrossFax for Windows, which provides fax port sharing and automatic fax/data switching.

CrossTalk for Windows 2.2 costs $179. CrossTalk with CrossFax costs $195. Both will be available later this month.

DCA: (404) 442-4000.

Hewlett-Packard Co. has unveiled four upgraded applications for **backup, software distribution and print management** that work with the firm's new OperationsCenter 1.1 systems management software.

The enhanced applications include OpenView OmniBack II and OmniStorage for data backup, storage and restoral management; OpenView Software Distributor for enterprisewide electronic delivery of software updates; and OpenView OpenSpool for network print administration.

OmniBack II costs $3,800, and OpenSpool costs $2,300. Both will be available in September. Software Distributor with PC support costs $2,500 and will ship in November. OmniStorage costs $12,000 and will be available in December.

HP: (800) 752-0900.

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SuperStack provides robustness ideal for any sized network.

‹ Was ›
Stackables lack redundant power.
‹ Is ›
SuperStack includes a Redundant Power System for fault-tolerant operation.

‹ Was ›
Stackables include hub management only.
‹ Is ›
SuperStack, with Transcend,™ enables integrated enterprise-wide management.

‹ Was ›
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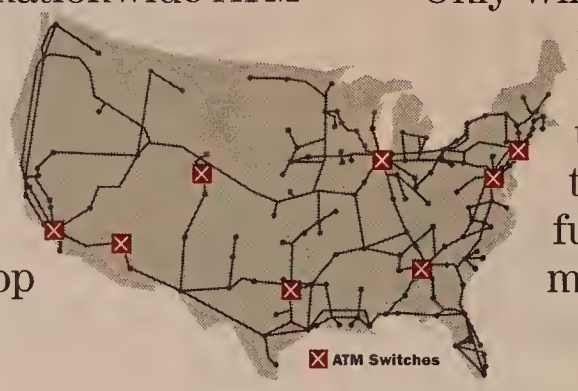

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DIGITAL SIGNATURE

IRS officials face predicament over implementation of DSS

BY ELLEN MESSMER

Washington, D.C.

As it modernizes its net systems, the Internal Revenue Service is on the horns of a dilemma regarding digital signature technology.

For internal purposes, such as remote access to tax record databases, the IRS is compelled to employ the Digital Signature Standard (DSS) for verifying user identities since it will become mandatory for federal agencies come December.

PHILCOX

But a continuing patent-rights battle over the DSS, and the government's lack of a certification authority for preventing fraud in digital signatures, is forcing IRS officials to question the use of the DSS for electronic communications with the public.

Users can electronically sign and verify documents using a digital signature, a function available through public-key cryptography. But to prevent fraudulent use of signatures, a certification authority is needed to register a user's identity and signature.

More than a year ago, the IRS laid out plans for using digital signatures in communications with banks, businesses, states and the tax-paying public (see graphic). The IRS also wants to build an Integrated Case Processing System to connect its databases nationwide so tax caseworkers can more easily obtain the information they need.

Digital signatures, used for remote database access and sharing documents electronically, are viewed by IRS information technology managers as an integral security feature in new systems.

The IRS, which already uses RSA Data Security, Inc. public-key encryption in routine communications with banking institutions, has seen its digital signature projects held up as the government argued for years with Sunnyvale, Calif.-based Public-Key Partners, Inc. (PKP) over patent claims to the DSS.

Under pressure from the White House to issue the DSS as a royalty-free standard — an issue that Vice President Gore views as critical to his National Information Infrastructure plans — the Department of Commerce finally approved the DSS last month.

But officials at the National Institute of Standards and Technology (NIST) say the government is ready to go to court over its own right to use the DSS and are warning companies to hold off using or developing products based on the DSS until the legal clouds clear.

"Prudent business people will sit back and wait," said Lynn McNulty, associate director of computer security at NIST. "There may be a settlement [with PKP] or legal action."

The controversy over the DSS puts the IRS over a barrel in terms of requiring it for use with the public. In addition, there is no government-operated certificate authority in place to issue digital signatures to the hundreds of thousands of businesses and individuals that may use them in communications with the IRS.

"I'm concerned about key management and the certificate process," said Henry Philcox, chief information officer. "There's the

See DSS, *page 18*

How the Treasury Department will use digital signatures

1. Taxlink — Financial institutions processing quarterly tax payments for businesses would send transactions signed with the DSS.

2. Electronic access to IRS tax information — When state governments need IRS tax information, they would send requests signed with the DSS.

3. IRS internal E-mail — DSS would be used to sign and verify all mail messages.

4. Uniform wage reporting — Employers would file quarterly wage forms electronically using the DSS.

5. Currency transaction reporting — Financial institutions would file currency transaction reports signed with the DSS.

6. External access utility — The IRS would give some 200 million individuals electronic access to tax information and would deliver forms electronically.

GRAPHIC BY ROCHELLE BRODER

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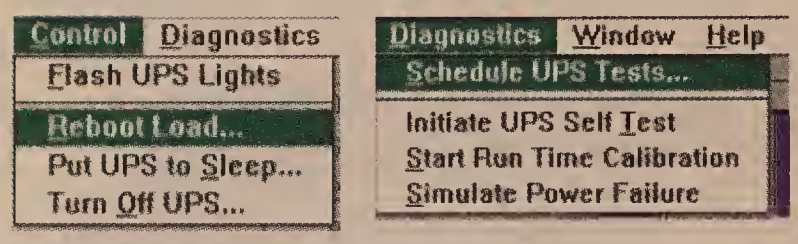

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PowerNet tracks and configures over 50 variables and generates traps on 16 different power events. The agent's variables fall into eight categories including input power, output power, and UPS configuration, identification, battery, control, test and management. Using optional Measure-UPS™, you can even wire door alarms, fire, smoke or other contact closure sensing device right into your WAN.

Out of the office? No crossing fingers...

Both PowerChute and PowerNet generate user alerts on power events. If systems are unattended or remote, they'll even shut down your server securely without you needing to lift a finger. You can configure the software to beep your pager upon power events, so you'll always know the state of your server or critical internet equipment.

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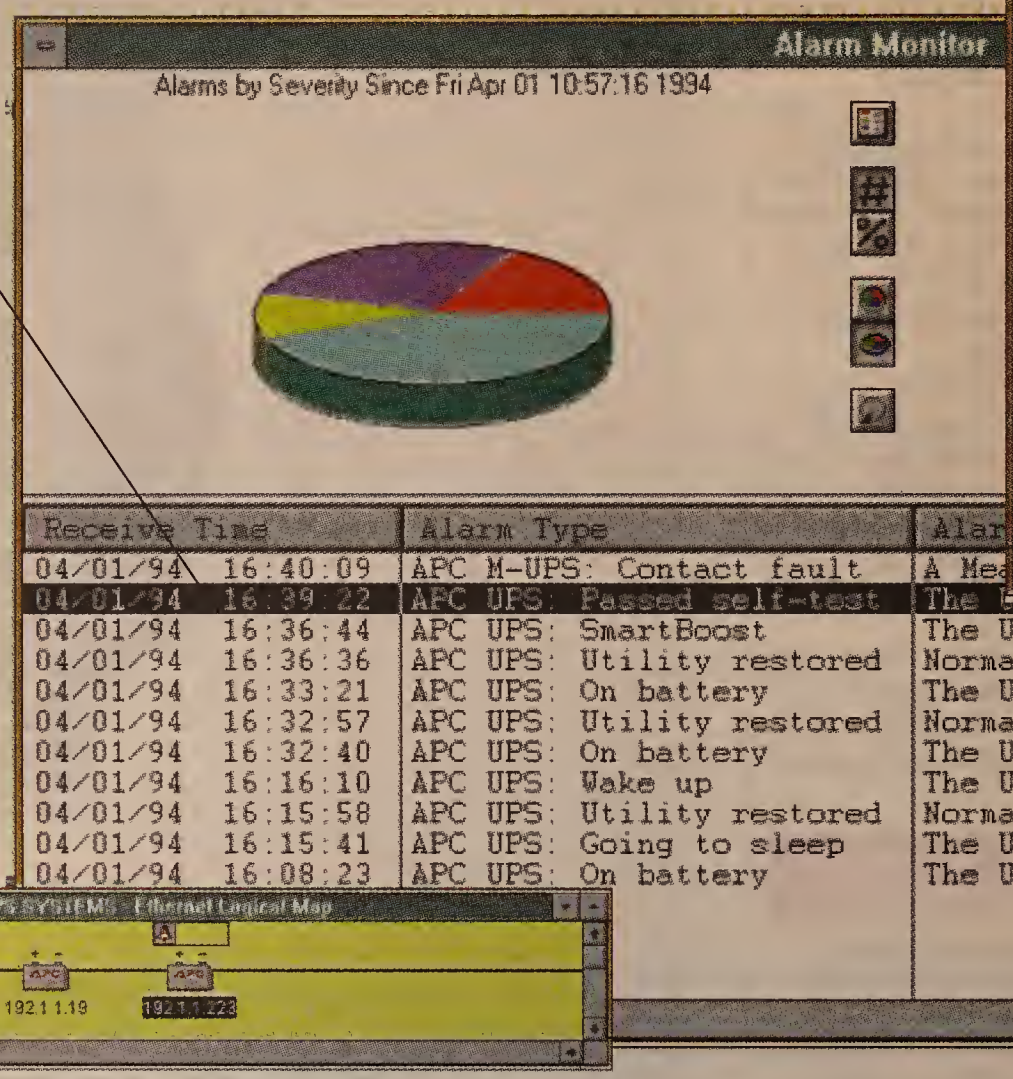
PowerNet and PowerChute® work with APC Smart-UPS® or Matrix-UPS® to provide instantaneous backup power to your equipment, and automatic warning messages to your users.



A blackout on a remote segment. An environmental control emergency. An unauthorized access. Data is lost, users scream, you sweat, and recovery can take hours.

Whether your network stretches across a desk or a desert, you can count on,

PowerChute *plus: power management software for automatic local network protection,* and

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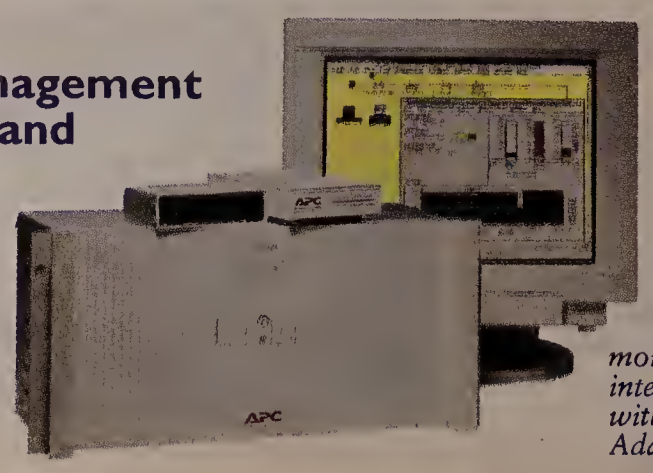
Eliminate downtime, save costs, diagnose problems, and rest easy at night. You get:

Unattended data protection for a long, happy career

APC software warns users of problems then performs an automatic unattended server shutdown with all data intact.

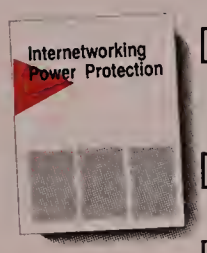
Central management for security and control

Allows full control of Smart-UPS and servers from the manager's console, saving travel and support costs. Staff can prevent problems before they happen, rather than react to downtime that an SNMP Smart-UPS would have prevented. The entire network can be downed and booted up at given intervals, increasing security by disabling the system during off hours.



Both PowerChute and PowerNet solutions work with all Smart-UPS, including APC's rack-mounted Smart-UPS for internet hardware, shown here with the PowerNet SNMP Adapter and Measure-UPS.

FREE guide tells you more about PowerNet (before your users do).



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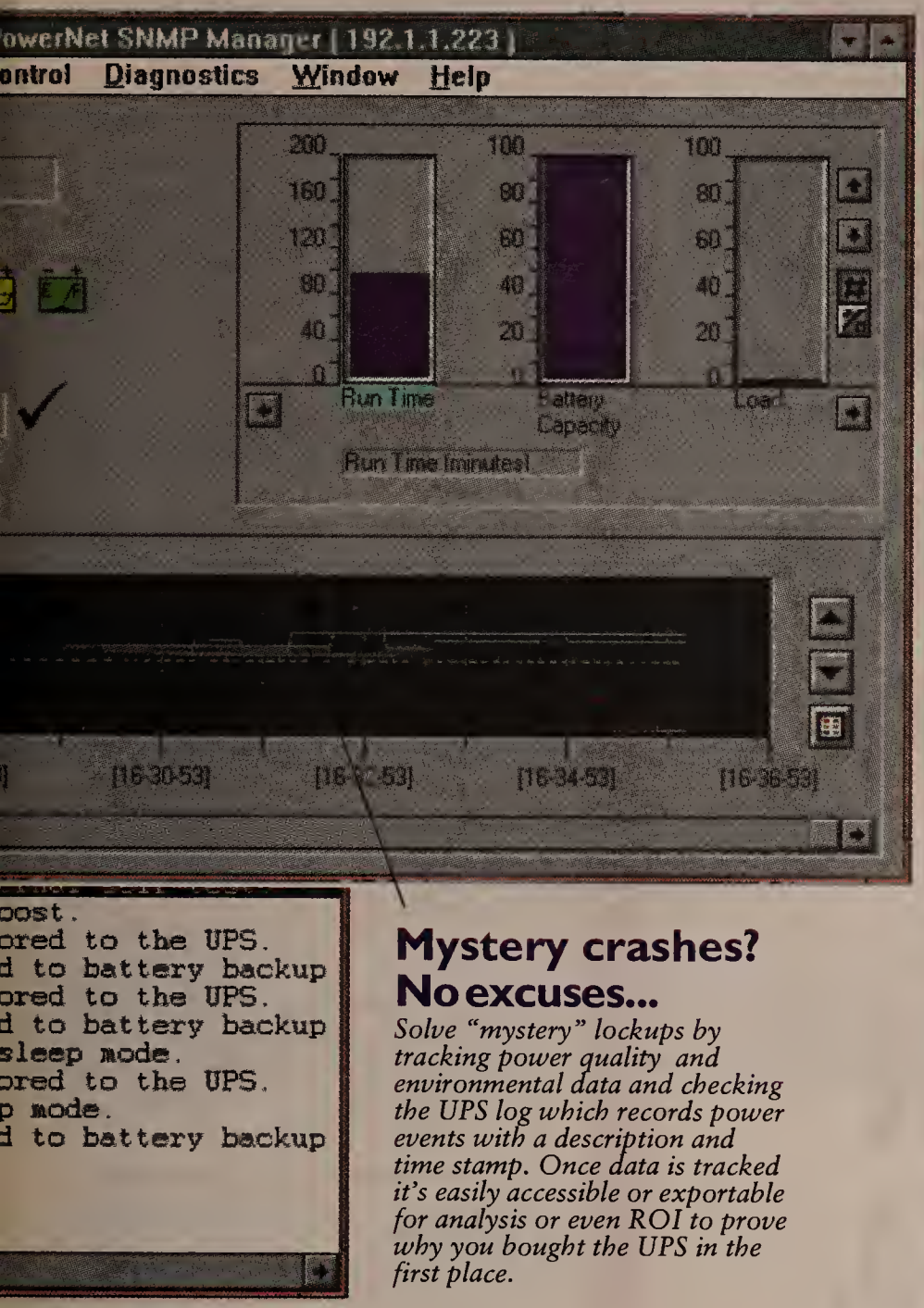

Mystery crashes? No excuses...

Solve "mystery" lockups by tracking power quality and environmental data and checking the UPS log which records power events with a description and time stamp. Once data is tracked it's easily accessible or exportable for analysis or even ROI to prove why you bought the UPS in the first place.

PowerNet the educated choice at UTenn

"We recently had temperature swings of 70- 140 degrees, causing a great deal of stress," says Matt Blackmon, Mngr. of Eng. and Technology, at the U. Tennessee Medical Ctr. at Knoxville.

"APC's PowerChute plus documented the swings and enabled us to solve the problem. APC's expertise in cross-platform software was a compelling reason for our choice. We're running Sun, SCO, and Novell, and PowerChute has been first rate for all. I use APC's PowerNet adapter with SunNet Manager, and it even dials my pager if there is ever a power problem I need to be aware of. External contact switches on APC's Measure-UPS will help us keep track of when people access our fiber closets. We saw demos, read literature - really did the homework. For price, performance and reliability, as well as forward looking type things like SNMP, APC was the clear choice..."

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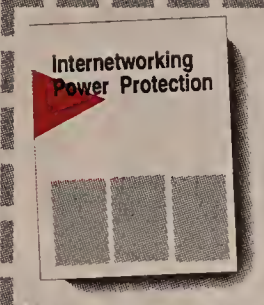
PowerChute is available for all major OS, while the PowerNet family works on all popular SNMP based NMS, including Insight Manager. Features may vary by OS and/or NMS.



FREE! WAN power management guide and/or demo disk!

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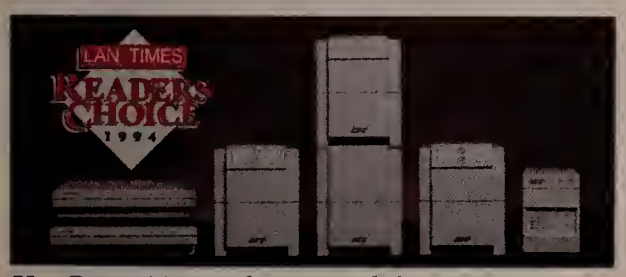
Since few managers have the time to physically walk around and test UPSes, now you can tell all your Smart-UPS to test their batteries at scheduled intervals, without leaving your console.



Use PowerNet with our modular Matrix-UPS or Smart-UPS family (above). You can't go wrong with UPS protection that's won more awards than all other vendors combined, including five consecutive LAN Times Readers' Choice Awards (1990-1994).

Tracks environmental data for easy diagnosis

Helps diagnose "mystery" crashes. Warnings regarding blackouts, brown-outs, dead batteries or other alerts are automatically delivered whether the Smart-UPS is located 20 feet or 2000 miles away. Instead of "dropping off the map" on the NMS whenever a local outage occurs, status is constantly communicated, even to your pager. With optional Measure-UPS, you can even monitor environmental conditions which can decrease reliability, including temperature, humidity, smoke, fire, water or door violations.

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Phase IV

Continued from page 11

dards Organization's 10589 Network Service Access Point (NSAP) standard.

For example, DECnet managers might manually allocate Phase IV address bits for DECnet end-node identification. ISO NSAPs, however, might automatically allocate Ethernet media access control address bits as end-node IDs, Kelsey said.

And although Kelsey and other HEPnet network managers had to learn link-state routing – Phase IV uses distance vector routing – to implement DECnet/OSI, the new routing algorithm makes HEPnet easier to manage, Kelsey claims. That's because DECnet/OSI nets can be split into routing domains of defined sizes, each managed separately.

Even though network managers have to learn new naming, addressing, routing and management conventions, Kelsey stressed that the migration to DECnet/OSI from Phase IV is relatively simple if it is planned and coordinated carefully and well in advance.

Kelsey can be reached at d.p.kelsey@rutherford.ac.uk.

IBM

Continued from page 11

mainframes.

The VTAM AnyNet Feature will also let TCP/IP Sockets clients access TCP/IP Sockets applications, such as X Window or Network File System, on the mainframe over SNA or Advanced Peer-to-Peer Networking backbones. This support not only gives TCP/IP users access to hosts on emerging APPN nets, but it increases the number of applications that can utilize an APPN backbone, Neiser said.

The VTAM AnyNet Feature will be a separately priced option for VTAM 4.2 when it ships June 24. IBM did not release pricing.

MORE APPN SUPPORT

The AnyNet/2 NETBEUI-over-SNA product will also increase APPN and SNA backbone utilization. Residing on an OS/2 node, AnyNet/2 NETBEUI over SNA will enable applications on NETBIOS-based LANs to communicate over SNA or APPN backbones.

The AnyNet/2 NETBEUI-over-SNA software is available for $110.

IBM made deploying AnyNet across the enterprise easier and less expensive by adding a new configuration option to the AnyNet/2 Sockets over SNA Gateway. Users can now set up AnyNet Sockets over SNA Gateway servers that can support increments of 20, 100 and 250 users. Until now, AnyNet/2 was required on every PC in an AnyNet environment.

"IBM faces a long uphill battle with AnyNet because they haven't shown a real compelling reason to use it."

Pricing for the AnyNet Sockets over SNA Gateway is $600 for 20 users, $1,950 for 100 users and $3,000 for 250 users.

"IBM faces a long uphill battle with AnyNet because they haven't shown a real compelling reason to use it," said Kevin Tolly, president of The Tolly Group in Manasquan, N.J.

One user is employing the technology to link Advanced Program-to-Program Communications (APPC)/LU 6.2 applications over a TCP/IP net.

Charles Hights, senior systems analyst with Pacific Bell in San Ramone, Calif., said AnyNet has helped his company keep its APPC-based mainframe applications while moving to a TCP/IP backbone.

"We thought we'd have to get rid of, or at least rewrite, the APPC applications once we moved to the TCP/IP backbone, but AnyNet on the mainframe and in our servers eliminated that problem," Hights said. "Now we have 14 servers and over 100 users accessing the APPC applications over our TCP/IP backbone."

✆IBM: (919) 254-5159.

DSS

Continued from page 15

question of how you set up this process – the management of the keys with the public becomes a massive problem."

A Certification Working Group – composed of representatives from the Department of the Treasury, NIST, the Department of Justice, the National Security Administration and the Federal Bureau of Investigation – has only recently been set up to deal with this problem.

Sources at the IRS say the agency will likely have to support both the DSS and RSA on a dual-use basis for the foreseeable future – an expensive and technically difficult proposition. In addition, the Treasury Department is exploring whether legislation is needed to clarify the public's obligation to use the DSS.

"We haven't taken a position on this," said the IRS source. "But we can't force a bank with 73 installations using RSA to just go to DSS."

Comments?

See "Contacts" box on page 2.

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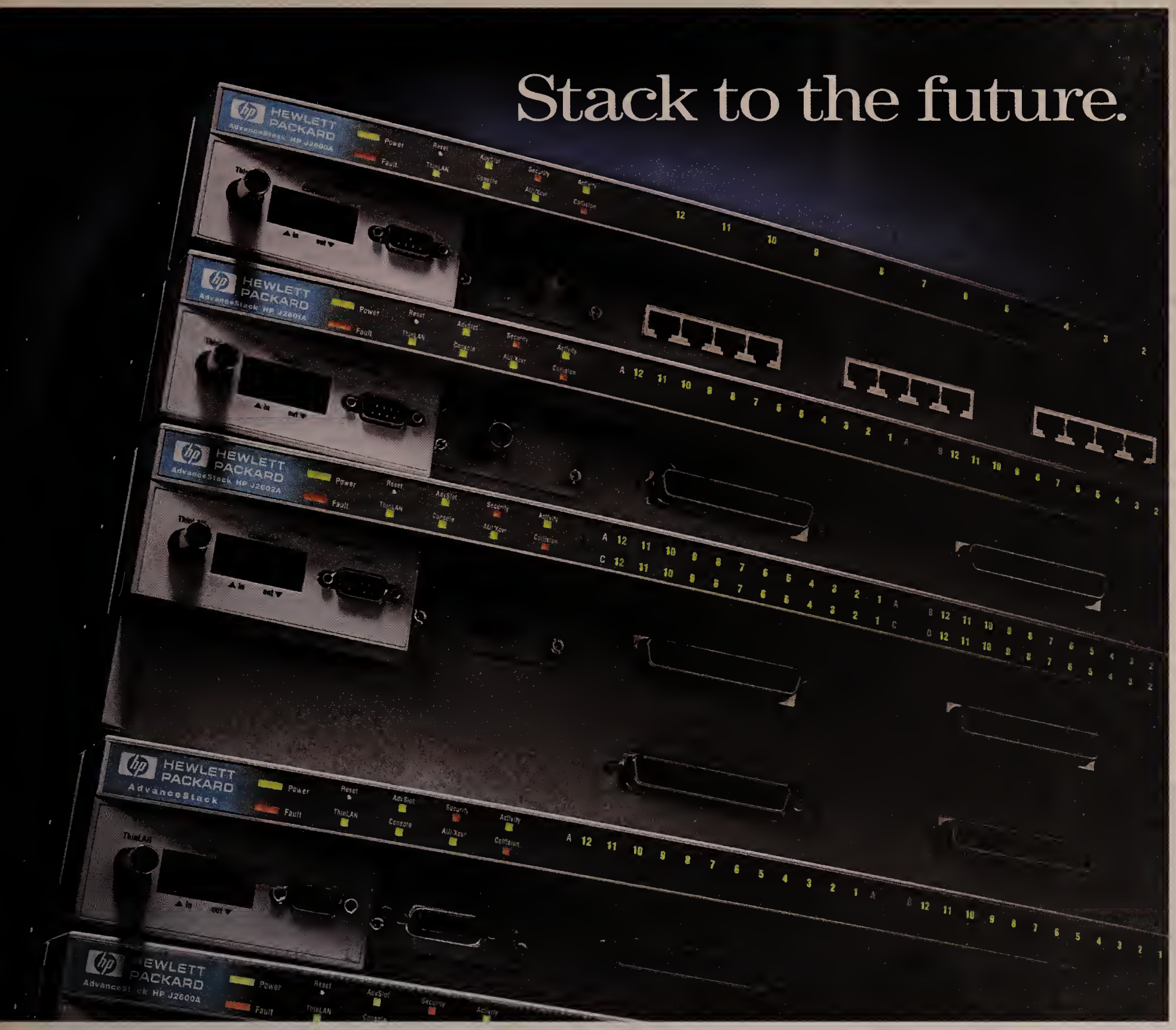

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Spry set to release new version of AIR Series

BY CARYN GILLOOLY

Seattle

Spry, Inc. last week released a new version of its AIR Series suite of modular TCP/IP applications that provides a more network-centric approach to LAN-to-host connectivity.

Like the previous release, the AIR Series 2.5 is a set of Transmission Control Protocol/Internet Protocol applications that provide access to mainframes, Unix hosts and the Internet. The suite consists of 11 applications that support electronic mail, terminal emulation, file transfer and other functions in environments ranging from Novell, Inc. NetWare local-area networks to IBM mainframe-based nets.

According to Richard Ting, product manager at Spry, based here, many other companies that focus on LAN-to-host connectivity provide the transport. But Spry has a different idea: "The market is shifting in such a way that soon, TCP/IP will be free," he said. "So we're not providing the transport. We're providing the applications that work over TCP/IP — over any TCP/IP."

The primary enhancement across all of the AIR Series applications is server-based installation. Before this release, each application had to be loaded on each individual personal computer that needed host connectivity. Version 2.5, however, lets the administrator download the applications to the individual PCs from the network server, either locally or from a remote location.

Several of the individual applications have been upgraded, as well. For example, Network File Manager — which is an implementation of File Transfer Protocol (ftp) that is integrated with Windows File Manager — now supports Digital Equipment Corp. VMS, IBM MVS and Sequent Computer Systems, Inc. drivers, letting ftp servers access these environments.

For Internet users, the AIR Gopher application uses a tree structure that helps users keep track of where they are in their Internet searches, a step up from the current text-based format.

Spry has also enhanced its FTP Server Windows-to-Unix connectivity. Now the FTP Server lets multiple users connect to a Windows PC — the previous version only allows a single-user connection.

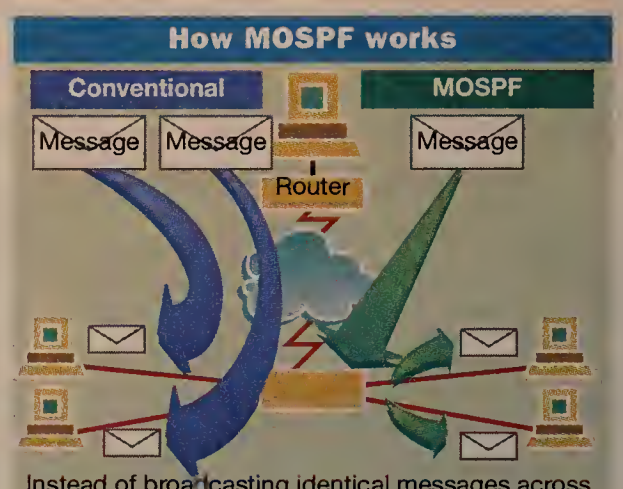
AIR Series 2.5 applications are available now in packaging options ranging in price from $149 to $399.

©Spry: (800) 777-9638.

MOSPF

Continued from page 11

minimum. For example, if multiple videoconference participants reside on the other side of a T-1 leased line, MOSPF will send only a single video stream over the line. The MOSPF routers accepting that traffic will then break up that video stream as needed.



Instead of broadcasting identical messages across a LAN internet to each recipient, MOSPF allows a user to send a single message, which is replicated by appropriate backbone or local routers. This helps reduce WAN traffic.

GRAPHIC BY SUSAN J. CHAMPENY

Other features include the ability to automatically reroute multicast traffic around net failures and provide type-of-service routing — for example, forwarding high-bandwidth multicast traffic over paths other than those used for delay-sensitive applications.

Until MOSPF, IP multicast packets could not be forwarded by commercial IP routers even though the extensions required of a Transmission Control Protocol/Internet Protocol host have been defined for some time. If an IP router received an IP multicast packet — identified as those having a Class D IP address — the packet would be discarded.

Each Class D address is said to represent a multicast group. A separate protocol called the Internet Group Management Protocol (IGMP) is used to define which TCP/IP hosts are in what multicast groups.

With MOSPF, a packet's source and destination multicast group are examined by the MOSPF router, which verifies that the packet was received on the correct port. If so, the router sends the packet out those ports leading toward active group members.

MOSPF is built on top of both OSPF and IGMP. Using OSPF — a link-state routing protocol — each router has a complete map of the routing domain. This map indicates which routers and networks belong to the OSPF domain and how they are interconnected. A MOSPF router then uses the IGMP protocol to monitor group membership on its attached LANs and adds this group location information to the map.

This map allows each MOSPF router to calculate an efficient path for a given multicast packet.

Today, most TCP/IP multicast applications are being implemented on workstations, which must support the IGMP protocol in order to convey the application's group membership to the MOSPF routers. IGMP support comes standard today on only a few vendors' products. When it doesn't, the process of introducing a multicast application can include modifying the workstation's operating system.

Multicast applications such as video can also chew up significant net bandwidth. To ensure that these applications get enough bandwidth — but not too much — resource management schemes must be deployed.

Moy is a senior staff engineer at Proteon, Inc. and coauthor of the OSPF standard.

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22 Operating Environments,
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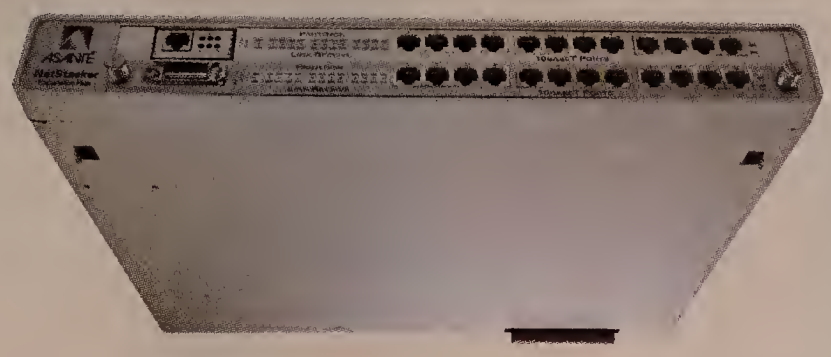

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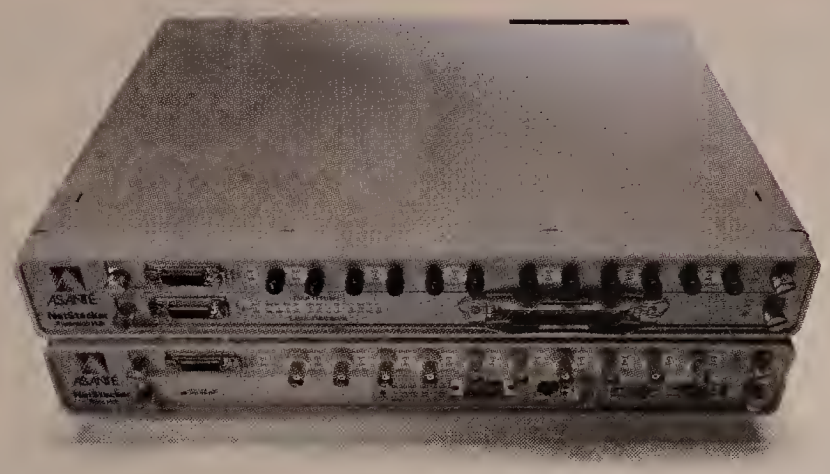
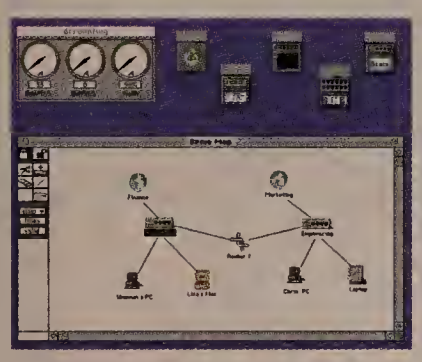


Until today, finding all the features of an Ethernet® chassis hub for the price of a stackable was literally impossible. But now, it's a snap with NetStacker™ from Asanté.™



AsantéView network management software allows you to graphically monitor and control your network from either a Macintosh or Windows PC.

NetStacker is a stackable chassis that allows you to start with a few users and add expansion units as your network grows. Installation is easy using SmartSnap,™ a unique link that simplifies the connection of up to three units and avoids bus cables. Each unit features a dual segment backplane and two slots for your choice of optional modules. These include RJ-45, RJ-21, BNC and Fiber multi-port repeater modules as well as the Asanté NetConnect bridge module.

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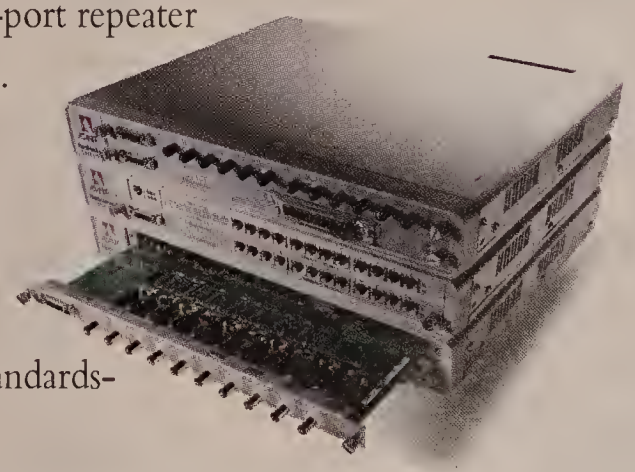

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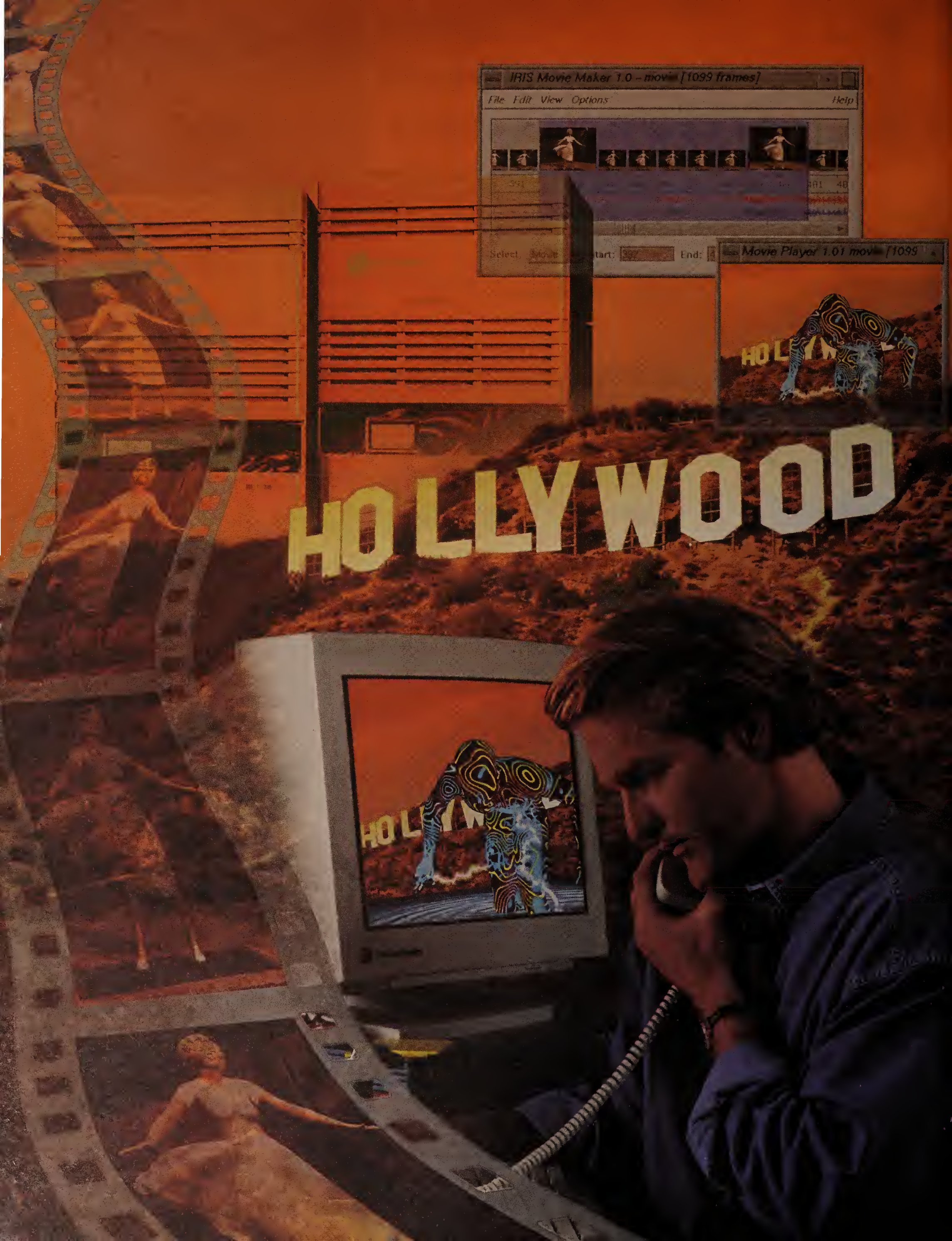
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CPU	i486	i486	Pentium	i486	Pentium	i486	Pentium
TOTAL SLOTS	3/5	5	5	7	7	9	9
ISA SLOTS	3/5	n/a	n/a	n/a	n/a	n/a	n/a
EISA SLOTS	n/a	3	3	5	5	7	7
LOCAL BUS SLOTS	2 VESA® option	2 PCI	2 PCI	2 PCI	2 PCI	2 PCI	2 PCI
RAM CAPACITY	64	128	192	128	192	128	192
ECC MEMORY	n/a	SIMM option	SIMM option	SIMM option	SIMM option	SIMM option	SIMM option
EXTERNAL CACHE	128KB option	256KB option	256KB	256KB	256KB	256KB	256KB
MEMORY BUS	32-bit	32-bit	64-bit	32-bit	64-bit	32-bit	64-bit
DRIVE BAYS-EXT.	2/3	3	3	4	4	4	4
DRIVE BAYS-INT.	1/2	2	2	4	4	8	8
POWER SUPPLY	150 Watt	224 Watt	224 Watt	300 Watt	300 Watt	530 Watt	530 Watt
VIDEO	Int. local bus	Int. PCI	Int. PCI	Int. PCI	Int. PCI	Int. PCI	Int. PCI
VIDEO RAM MAX.	2MB	2MB	2MB	1MB	2MB	1MB	2MB
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L2010-0140

Hospital lays groundwork for network

BY SKIP MACASKILL

Exeter, N.H.

Exeter Health Resources, Inc. (EHR) is in the midst of a local-area network redesign that will allow it to extend its reach into the community and tap surrounding medical facilities for needed expertise and technology.

The health services firm's multiphase effort will make use of emerging high-speed technologies such as Asynchronous Transfer Mode (ATM) and Integrated Services Digital Network to link more than 50 remote physicians' offices as well as other nearby health care networks to its hospital LAN.

"Our ultimate goal is to make various levels of information accessible to all caregivers in the area with appropriate security and management," said David Breiden, MIS director at Exeter Hospital, a small community-based facility that acts as the hub of the EHR system. Currently, information is only available in small [unconnected] islands across the community."

To get the hospital started on its net overhaul, Bob Levine, president and chief executive officer of hub vendor Cabletron Systems, Inc., donated $150,000 from a family trust fund. The money will be used to upgrade the hospital's existing information infrastructure with new personal computers and software.

The hospital's 10Base5 Ethernet LAN, anchored by two Compaq Computer Corp. 25-MHz servers, has been stretched thin as more than 200 nodes have been connected to it in recent years. The network, which supports electronic mail and other applications, originally was designed to support 20 users.

Trustworthy

The Levine Family Charitable Trust has contributed more than $2 million in donations to needy organizations since it was established in 1989.

In the first stage of the project, which is expected to be completed by fall, the hospital will swap out the existing servers for two new 50-MHz Compaq 80486-based servers with a higher degree of fault tolerance.

"In a health-care network, the phrase 'mission critical' takes on added significance since we are literally dealing with life-and-death situations," Breiden said. "Network downtime cannot be tolerated."

In addition, the hospital is transitioning its operating system from Banyan Systems, Inc. VINES to Novell, Inc. NetWare 3.11 running Novell's System Fault Tolerance III application. The switch was made because most of the software applications needed by the hospital are more readily available on NetWare.

See **Hospital**, *page 27*

Vendor readies compression, encryption software for NetWare

NLMs to help NetWare 3.X users get on level with NetWare 4.X.

BY CARYN GILLOOLY

Houston

The LAN Support Group, Inc. this week is expected to bring out new products that will for the first time offer Novell, Inc. NetWare 3 customers server-based data compression previously available only with NetWare 4.

The new NetSqueeze product line will help users reduce server disk space as well as save time and space on backup devices — which can cut operating costs.

The product line marks a departure from the company's existing primary product, its BindView Network Control System network management offering.

The centerpiece of the product line, software called NetSqueeze, is a set of NetWare Loadable Modules for both NetWare 3.X- and 4.X-based servers. The software gives users data compression capabilities that can help reduce disk space by as much as 60%, according to the company.

"Everybody needs more disk space, no matter what type of net they're running," said Eric Pulaski, president of The LAN Support Group, based here.

Today, NetWare 3 and NetWare 4 customers have different choices for data compression. NetWare 4 customers have the luxury of using the new network operating system's built-in compression capabilities. But for NetWare 3.X users not moving to 4.X, the only available compression options run on separate workstations and require a terminate-and-stay-resident (TSR) program on each client.

Putting the squeeze on data

The new NetSqueeze product provides:

- Data compression for NetWare 3.X and 4.X customers
- Server-based compression without a client-based TSR
- File-by-file as well as global-rule compression
- Continuous and sweeper mode compression choices

...which give customers:

- As much as 60% more disk space
- More secure compression
- Faster backups

"My company has about 40 servers running NetWare 3.X and none running 4.X. I do not anticipate this changing any time soon," said Glenn Fund, president of the Greater Boston Area Novell Users Group.

But he added that server-based data compression is something he and other customers cannot get while still running NetWare 3.X, despite a need for it.

NetSqueeze gives customers a variety of compres-

See **NetWare**, *page 27*

3Com bulks up its chassis hub lines

BY SKIP MACASKILL

Santa Clara, Calif.

Despite its passionate love affair with all things stackable, 3Com Corp. has not forgotten that chassis-based hubs also need affection.

The company last week bulked up its top chassis hub lines — the switch-based LANplex 6000 and LinkBuilder Multi Services Hub (MSH) — with new routing and management capabilities for use across enterprise nets. The new features will be available via free software upgrades.

The new routing support in the LANplex 6000, a high-end switching hub that 3Com obtained last year when it bought Synernetics, Inc., will allow users to route Internet Protocol traffic locally among subnets supported by the device. This will eliminate the need to install a stand-alone router in front of the hub for directing such traffic.

"Adding local routing capabilities to the switch eliminates the need to add a stand-alone router to the network mix, which means traffic can go between different physical workgroups or virtual LANs more efficiently," said Melinda Le Baron, program director at Gartner Group, Inc., a consultancy in Stamford, Conn. "For 3Com to play in the high-end switching hub market, routing support is essential."

New routing enhancements to the hub will also let users build virtual local-area networks in which groups of physically disparate users are tied together into the same logical network. In addition, the new routing software upgrade will enable net managers to interconnect those virtual LANs.

The virtual LAN capability, which currently can only be used within the confines of a single LANplex 6000, will be able to span multiple hubs by year end, 3Com officials noted.

According to Tom Medrek, director of marketing for 3Com's switching division, the company will

See **3Com**, *page 28*

Digital offers DEChub options

BY JIM DUFFY

Maynard, Mass.

Digital Equipment Corp. has announced limited time packaging and pricing incentives for its DEChub products in an effort to entice users looking for stackable local networking alternatives.

The new offerings include an Intelligent Stackable Starter Package containing a DEChub 90 backplane and three DECrepeater 90T hub modules as well as a new five-pack of DECrepeater 90Ts.

The DEChub 90 is an Ethernet hub that can house as many as eight modular repeaters, routers, bridges and terminal servers. The DECrepeater 90T is a 10Base-T Ethernet repeater that can operate either within a hub or on its own.

See **DEChub**, *page 28*

BRIEFS

Fore Systems, Inc. last week announced the AVA-200 ATM Video Adapter and AVA Real-Time Display Software. The AVA-200 is a stand-alone device that can handle three **real-time video** inputs, sending that traffic out as independent Asynchronous Transfer Mode streams to ATM-based workstations over a 100M bit/sec link. The software runs on each desktop and lets the video feed be displayed on the screen. The system is designed for point-to-multipoint video broadcasting.

Available now, the AVA-200 costs $12,995, while the software license costs $495, plus $99 per user.

Fore: (412) 772-6600.

Chipcom Corp. has rolled out the ONcore Ethernet Private Line Card (PLC), which is a new daughtercard for its ONcore line of switching hubs that enables **private net conversations** on Ethernet nets. To prevent eavesdropping, PLC provides a continuous autolearning capability that discovers all attached network users and then filters out information they are not supposed to receive.

Available in the third quarter, PLC costs $1,995.

Chipcom: (508) 460-8900.

The **Certified NetWare Engineer Professional Association (CNEPA)** has announced that it will change its name to the **Network Professional Association (NPA).** According to Berkeley Geddes, president of the NPA, the organization made the change to better reflect the reality that CNEs have evolved into industry experts on networking and are not necessarily focused on just Novell, Inc. NetWare issues.

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The new DEChub 900 MultiSwitch makes managing growth and change simple.

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NetWare

Continued from page 25

sion options. First, the product lets administrators specify individual files or directories to be compressed. The administrator can also set up global rules whereby all files ending, for example, in .BAK will be compressed automatically.

Other products available can only compress an entire disk partition at a time. Not only does that limit flexibility, but it can also be dangerous.

"If you're using a TSR that compresses an entire disk partition and that disk fails, you've lost all your data," Pulaski said. "But if you're compressing one file at a time and someone comes and pulls the plug out of the back of your server, the most you'll lose is one file."

NetSqueeze also gives the administrator the ability to run compression in either sweeper mode or continuous mode. Sweeper mode runs through a server's hard disk at an administrator-defined time and squeezes all files that are flagged. Continuous mode will compress all flagged files on the fly as they are stored on the file server.

Through an addition to the product called NetSqueeze+Encryption, the user can get server-based encryption capabilities not otherwise available with NetWare 3. NetSqueeze+Encryption lets users protect individual files with passwords.

"The goal [with encryption] is to let people store private files on the file server," including information that might not be appropriate for a net administrator to see, Pulaski said.

Gary Hamm, technology coordinator in the Houston office of William M. Mercer, Inc., said the NetSqueeze products are tempting. "I'm glad The LAN Support Group had the foresight to provide a compression and encryption solution for companies not quite ready to move to NetWare 4.X," he added.

Prices for NetSqueeze and NetSqueeze+Encryption are based on the current version of NetWare installed. Prices for NetSqueeze range from $295 if used with the five-user version of NetWare to $1,295 if used with the 250-user version. Pricing for NetSqueeze+Encryption ranges from $495 to $1,995 for the same NetWare versions.

©LAN Support Group: (800) 749-8439.

Comments?

See "Contacts" box on page 2.

Hospital

Continued from page 25

In the second stage of EHR's migration, slated for late summer, the hospital will replace the existing 10Base5 cabling with a fiber backbone and 10Base-T unshielded twisted-pair wiring for local connections. EHR will also replace its unmanaged Cabletron hubs with intelligent devices that will better enable the hospital's net management staff to provide connectivity between users and servers.

The most critical stage of the EHR project will get under way by year end and include the establishment of a wide-area network that will link approximately 50 physician offices into the hospital system. Breiden is still evaluating how to best accomplish this.

A network health plan

Exeter Hospital's three-year plan to restructure its network to deliver health care services more efficiently.

Stage 1:
Install fault-tolerant servers and migrate to NetWare 3.11.

Stage 2:
Replace 10Base5 wiring with fiber-optic backbone and unshielded twisted-pair cabling for local distribution.

Stage 3:
Build a WAN that will interconnect more than 50 physicians' offices and a long-term care facility with the hospital net.

Stage 4:
Migrate to a high-speed networking technology such as ATM in order to tap into services and applications available through other health care nets.

"We're looking at ISDN because it offers a cost-effective way to tie several remote offices into the corporate network," he said. "ISDN will also be a good solution for reaching physicians at home when it is necessary to send them copies of lab reports or X-rays after hours. The question with ISDN is one of availability."

Breiden is also evaluating a number of routers and talking with his local cable company to see if tapping into its fiber-optic network is a possibility.

The fourth and final stage of the hospital plan includes the introduction of ATM over the next two or three years. ATM functionality will allow for videoconferencing and high-speed data transfers that will enable physicians to consult with one another in real time during operative procedures or ultrasounds. It will also allow the EHR system to interconnect with larger, more sophisticated hospital systems in the region in order to tap into their areas of expertise or access services not available within the EHR system.

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Bill Jones, MIS, age 38

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3Com

Continued from page 25

add routing support for Novell, Inc.'s Internetwork Packet Exchange (IPX) protocol in the near future. 3Com will seriously evaluate the inclusion of the AppleTalk protocol, as well.

The addition of routing will put the LANplex 6000 switching hub into a high-end category already populated by Alantec Corp.'s PowerHub, Cabletron Systems, Inc. MMAC-Plus and Standard Microsystems Corp. EliteSwitch/1, analysts said.

In addition to routing and virtual LANs, 3Com also rolled out a $12,500 10Base2 Ethernet Switching Module for the LANplex 6000 that provides dedicated 10M bit/sec connections to the desktop via a BNC port. It is available now.

The company also announced that its net management application for LANplex hubs — Transcend LANplex Manager — will now be available on the Hewlett-Packard Co. OpenView platform, complementing existing support for SunConnect's SunNet Manager net management platform.

Transcend LANplex Manager will now be available on the Hewlett-Packard OpenView platform.

3Com bolstered its wiring closet-based MSH with support for the Ethernet Remote Monitoring (RMON) Management Information Base, which will allow users to garner a variety of net information on traffic patterns and historical trends through the hub.

Implemented in the form of a software-based SmartAgent, the RMON feature is available now as a free upgrade.

The company also rolled out two new modules for the MSH. The Fiber RingBuilder provides either a shielded twisted pair- or fiber-based set of ring-in/ring-out ports for token-ring workgroups, while the new seven-port 10Base-T module provides six 10Base-T ports and a user-selectable backbone connection that can be fiber-, coaxial cable- or twisted pair-based.

Available now, the modules cost $1,995 and $1,595, respectively.

✆3Com: (408) 764-5000.

DEChub

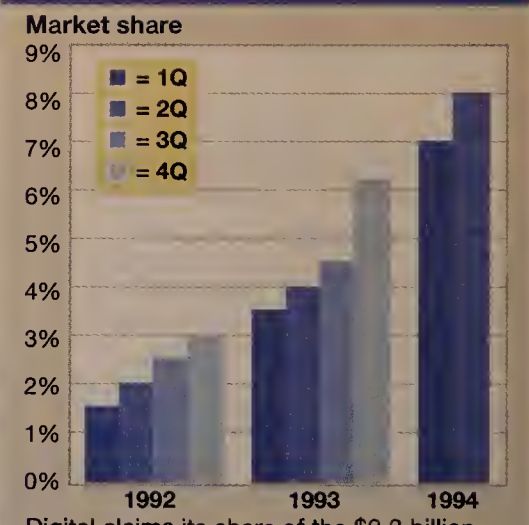
Continued from page 25

The new packages provide Ethernet connections at $83 per port, up to 40% less than the cost of individually purchased DEChub products, said William Maro, who is group manager for Digital's Network Interconnect product group.

The Intelligent Stackable Starter Kit costs $1,995. The DECrepeater 90T five-pack costs $3,975. A single DECrepeater 90T for existing DEChub users now costs $895 while a stand-alone version costs $1,030.

Prices have also been reduced on the DECbrouter 90, a two-port multiprotocol router developed jointly by Digital and Cisco Systems, Inc. A DECbrouter 90 now costs $3,450 for existing DEChub 90 users, a price reduction of 20%. A stand-alone version costs $3,500.

Stairway to Hubdom



Digital claims its share of the $2.3 billion hub market has been steadily increasing and now accounts for about $200 million in annual revenue.

GRAPHIC BY SUSAN SLATER

Maro said the pricing and packaging options will make it easier for customers to add incremental functionality, such as internetworking, to basic physical connectivity requirements without making wholesale equipment changes.

Analysts said Digital is following a trend in the stackable hub market to make products more attractive via new pricing packages, said Melinda Le Baron, program director for local-area communications at market research firm Gartner Group, Inc., in Stamford, Conn.

"Digital's the third hub vendor to come out with second-generation intelligent stackables" after Hewlett-Packard Co. and 3Com Corp., she said.

Digital is "following the trend and it makes sense," she added.

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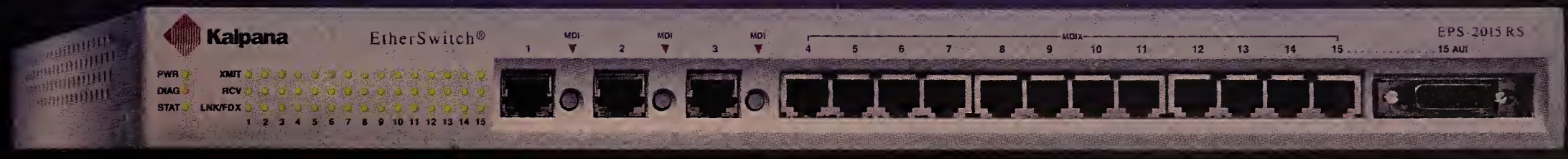

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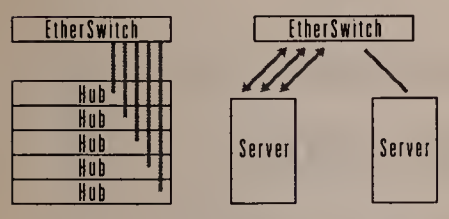

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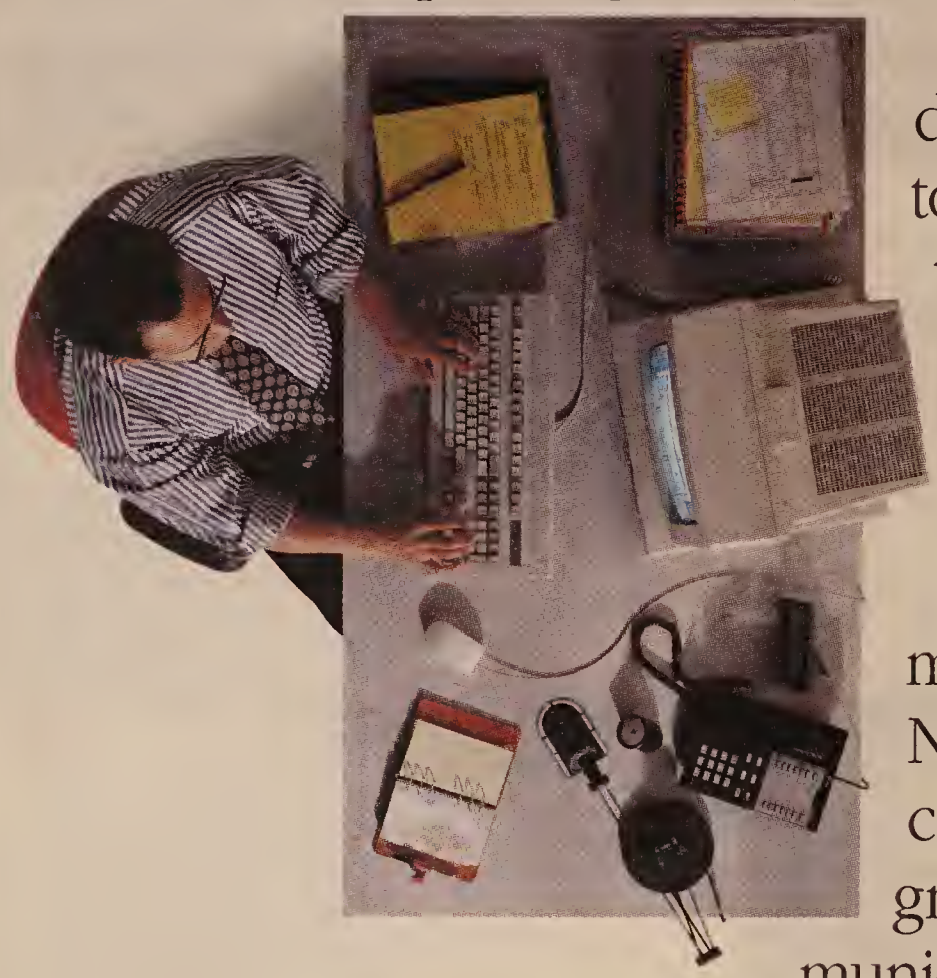

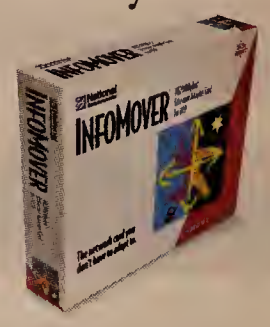

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PC MAGAZINE EDITORS' CHOICE
December 21, 1993
NE4100 PCMCIA Ethernet Adapter Card

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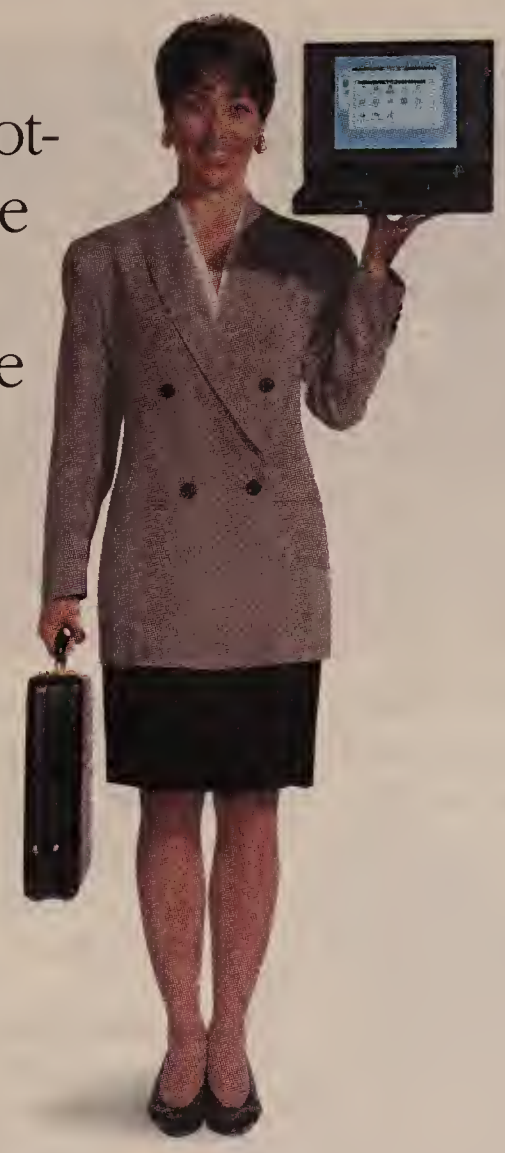

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NET RESULTS

by Mark Gibbs

Federal Express and the seven MIS sins

As he handed me yet another copy of the Novell, Inc. *UnixWare Resource Guide,* the Federal Express delivery guy said to me, "You write about networks, don't you?" I tried to deny it, but he was having none of it.

"Did you see that article in *Newsweek*?" he asked. "The one that says that networks can't do the job."

Needless to say, my ears pricked up. Later that day, he dropped the article off to me. (Now that's what I call a delivery service.)

The article, "Rethinking Your Mainframe," appeared in *Newsweek's* June 6 issue. It claims that personal computers, networks and client/server computing are duds. The argument is that many organizations have been sucked into wholesale downsizing only to find that they are throwing money away.

The end result is described in the article by Richard Finkelstein, president of Performance Computing, Inc. in Chicago, as "chaos." He goes on to say that "half of America's major companies have been swept up by a fad that could waste billions."

The sweeping generalizations in the article are, I believe, a gross exaggeration and place the responsibility in the wrong place.

The problems that companies face are not due to PCs, networking, client/server architectures or technologies. Nor are they due to mainframes, minicomputers or any other computing devices.

I think that the whole issue arises because MIS gets involved in one or more of the Seven Sins of Information Technology. These sins lead commentators to incorrect conclusions such as those in the *Newsweek* article.

The first sin is pride — pride in a single solution to a business information technology problem.

The doctrine of "one size fits all" doesn't work in clothing and doesn't work in computing, either.

It is a heterogeneous world out there whether you like it or not. So if you think that IBM, Hewlett-Packard Co., Microsoft Corp., Novell, Sun Microsystems, Inc. or anyone else can supply all the pieces, you're going to be vexed. This means that you must be committed to a lot of integration work based on multiple solutions.

Avarice is the next sin. In the context of computing, this is equivalent to "I want it all, and I want it now." Or to put it another way, trying to do too much too quickly with the expectation of an immediate payback.

Lust for technology is a sin that results in throwing the least stable but most feature-rich products at a problem that's poorly defined. The result of avarice and lust is that many networking projects falter or fail.

Because the potential failure for networked PCs is so great, companies tend to go for solutions that make it almost impossible for the technologies to succeed. Enter envy.

Envy is the result of failed downsizing projects — "Gee, I wish we had done like such and such a company did" or "I wish we'd used that technology," or any of the other whinings that we hear.

Gluttony is a particularly egregious sin. When the impulse for satisfying the urge to deploy and manage technology becomes so important that it transcends the real needs of the users, it almost guarantees that the project will fail.

Sloth is simply doing nothing, dragging your heels and being unwilling to take a risk.

Anger is an extremely common sin that is the result of doing nothing. If you hold out and don't explore the options, sticking with your "big iron" for the sake of comfort and apparent safety, anger will enter into your world. Your board, boss, shareholders or whoever are going to accuse you of missing strategic opportunities. One of you will be angry.

So as networking advocates, let's make sure that we're not guilty of these sins and see if we can stop articles like the one in *Newsweek*.

I wonder what Fedex will deliver this week.

Gibbs is a consultant and writer in Ventura, Calif. He can be reached at (800) 622-1108, Ext. 504, or on the Internet at mgibbs@rain.org.

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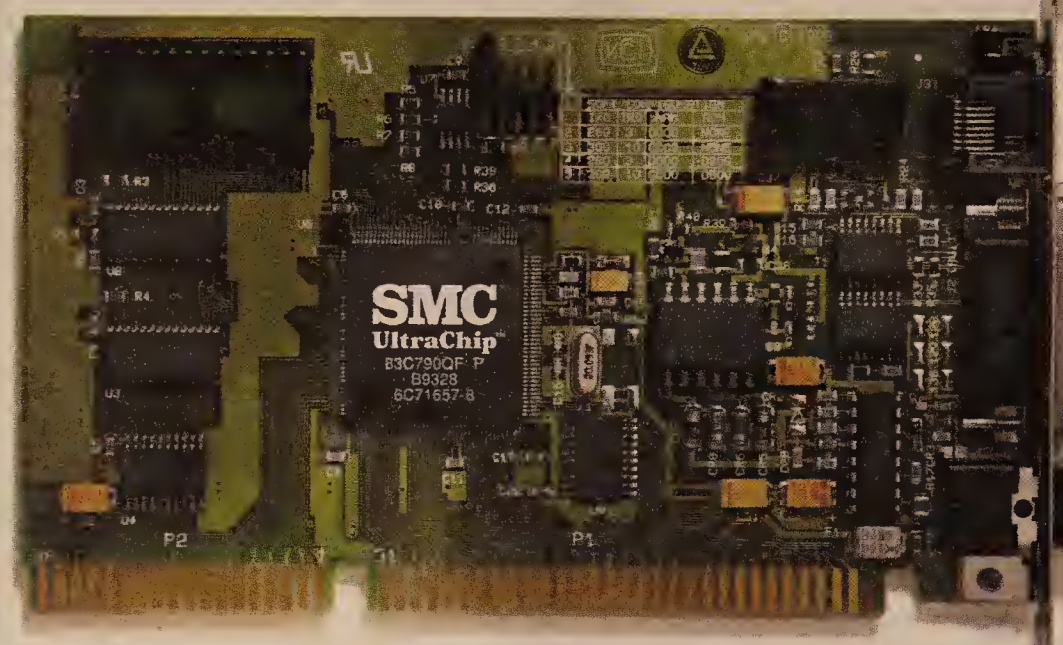

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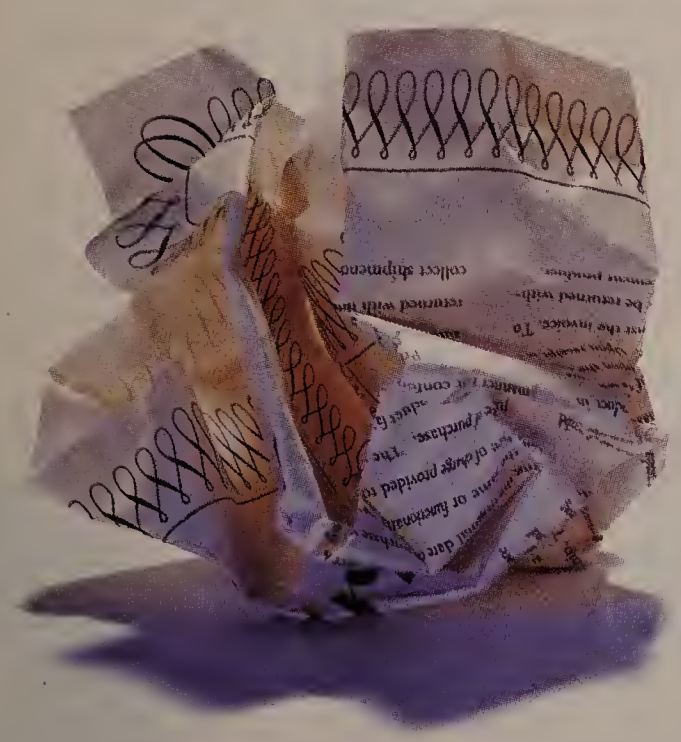

Hewlett-Packard's lifetime warranty excludes power supply and fan assemblies.

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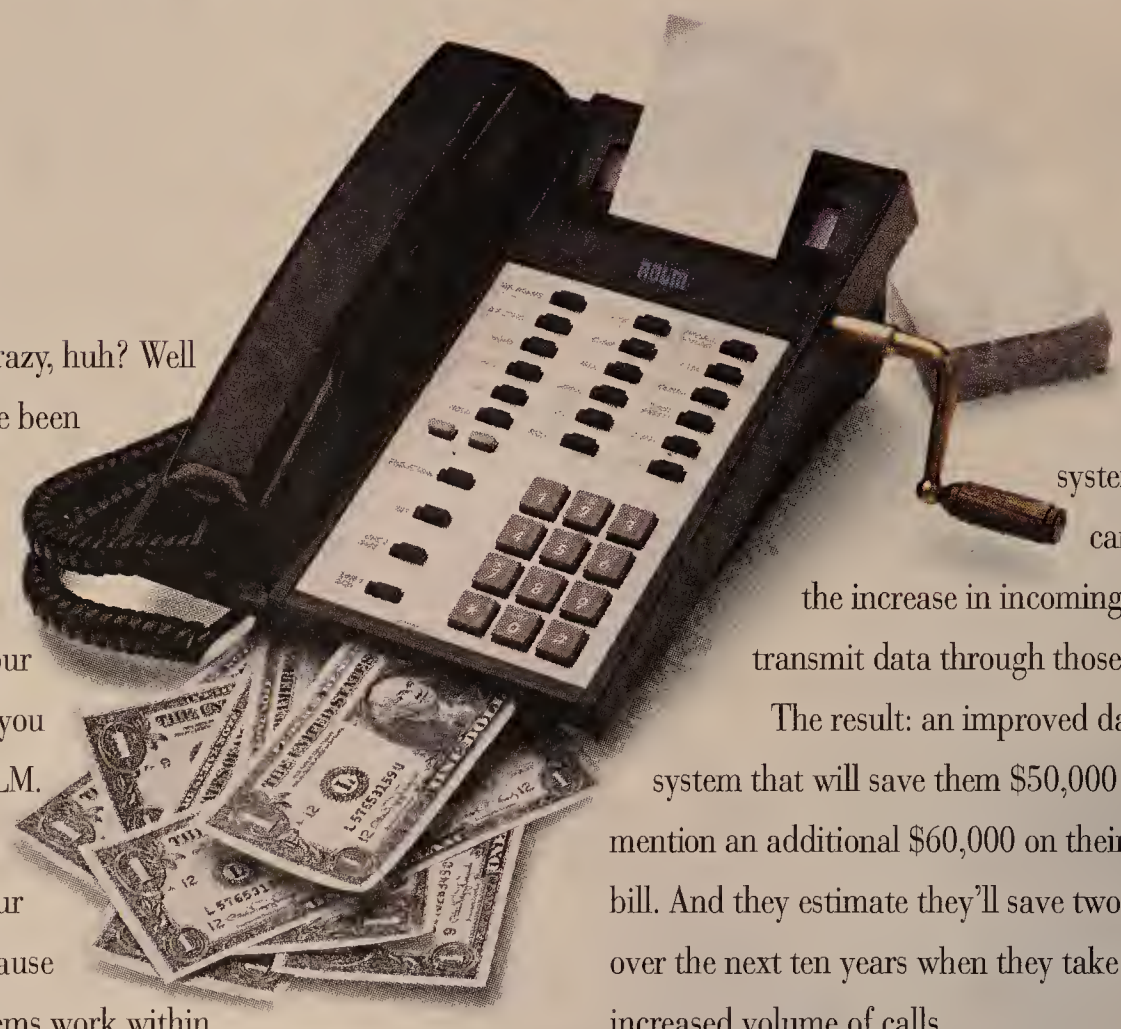
Here's a novel idea. IT actually making money.



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BRIEFS

RadioMail, Inc. will soon launch a **directory service** for its wireless/wired network gateway service and messaging application. RadioMail subscribers will be able to send the name of a would-be message recipient to the RadioMail directory; the directory will then deliver the recipient's RadioMail address to the user.

Europe-bound customers of **Ameritech Cellular Services** can now smoothly transition among cellular nets by inserting a special card into Ameritech cellular phones. Travelers in areas supporting the **Global System for Mobile Communication (GSM)** — the international standard for digital cellular communications — can insert the card to switch to the European frequency for cellular, activate the phone and identify the user. Calls are automatically billed to customers' Ameritech accounts.

RAM Mobile Data is expected to soon make a similar announcement to Ameritech's. RAM Mobile has reportedly allied with partners to provide a service allowing traveling users to swap radios to accommodate the frequency of a given country's packet radio service.

Bell Atlantic Mobile last week announced Office Direct, which lets a cellular phone operate much like an extension of an office phone system. Office Direct integrates cellular and land-line phone nets for **abbreviated dialing** to and from a cellular phone using four- or five-digit extensions.

The service should also cut back on long-distance bills, as users will have access to home offices' least cost routing that has been negotiated with long-distance carriers. Bell Atlantic Mobile charges a onetime interconnection fee of $2,000, and regular access, toll and airtime charges apply.

US WEST, Inc. has announced the upcoming launch of a series of **Advanced Intelligent Network (AIN)** business services, including call routing by caller's location and by the time of day and day of the week. The carrier will also offer a set of intelligent call-forwarding services. US WEST plans to offer these AIN services in Denver, Minneapolis-St. Paul; Portland, Ore.; Salt Lake City and Seattle this year. Albuquerque, N.M., will get the services in the first quarter of next year.

Belgium's national and international telecommunications carrier, **Belgacom,** has formed a mobile subsidiary as a joint venture with **AirTouch,** a wireless spinoff of **Pacific Telesis.** AirTouch will acquire a 25% stake in **Belgacom Mobile** for about $147 million. There are about 30,000 subscribers for the Belgian GSM net, launched in January.

Rochester Telephone Corp. subsidiary **RCI Long Distance** last week said it has signed a contract with BIG Entertainment, a multimedia entertainment company in Boca Raton, Fla., to create an **interactive prepaid long-distance calling card.** It will let users place calls anywhere in more than 220 countries, order BIG's Tekno-Comix merchandise, get Tekno-Comix news and play interactive trivia games. Tekno-Comix is a line of printed comic books that will be launched in November.

MCI jumps back into the resale business

BY DAVID ROHDE

Southfield, Mich.

In a reversal of policy, MCI Communications Corp. has decided to sell discounted network services through so-called switchless resellers.

The move means that users that are not big enough to negotiate their own contract tariffs or other special deals can now enjoy some significant savings by handing traffic over to MCI service resellers.

Within 90 days, MCI will begin a beta test of discounted services using three or four resellers, said Dan Dennis, president of MCI's Carrier Services Division, based here. The firm expects to roll out service to a broader list of resellers eventually, he told *Network World,* with the exact offering to be determined by the beta test.

DENNIS

Switchless resellers are marketing companies that do not own switching facilities but purchase network capacity in bulk from other carriers and resell it to businesses. For the past several years, they have been aggressively marketing time on the nets of AT&T, Sprint Corp., WilTel and LCI International, Inc., leaving MCI the lone major carrier without a reseller program.

MCI stopped dealing with switchless resellers in the 1980s after complaints arose that its resellers were switching customers from other carriers without customers' explicit permission — a practice known as "slamming."

The long-rumored reversal — the result of much discussion within MCI — was revealed by Dennis at a meeting last month of the Telecommunications Resellers Association in Palm Springs, Calif.

"There are two camps in the firm, one of them thinking that it's ridiculous dealing with resellers," said John Jones, a sales agent for Master Vision, Inc., a telecommunications marketing company in Greensboro, N.C. "But, apparently, the more realistic of the groups realized that there's a market for it."

MCI earlier this year started moving in this direction by allowing one of its big corporate customers, Hertz Corp., to resell its MCI bulk service arrangement through the same Hertz subsidiary that handles resale of its AT&T Tariff 12 deal (*NW,* Jan. 24, page 34).

The service has been a hit, according to Jones, who acts as an agent for Hertz. Fifteen customers — including some private-line users — have signed up for the MCI program in his area, saving 15% to 20% off tariff rates.

According to Dennis, MCI will

See **Resale,** *page 39*

AT&T fights its own resale battles

As MCI Communications Corp. decided to bandage up old wounds and let independent marketing companies resell time on its network, AT&T was wound up in a new round of disputes with its own resellers.

In recent filings with the Federal Communications Commission and federal courts, resellers allege that AT&T is dragging its feet in turning on service to new customers that have purchased cut-rate deals from resellers. Such allegations have periodically dogged AT&T.

GE Exchange, a division of General Electric Capital Communication Services Corp., has notified the FCC about slow service from AT&T. The unit of the giant electronics firm is trying to emulate Hertz Corp.'s success in reselling its AT&T Tariff 12 deal (*NW,* Jan. 24, page 34).

And two other resellers — Telegroup, Inc. in Fairfield, Iowa, and Progroup, Inc. in Chicago — have filed suit in federal court against AT&T. They allege AT&T is unfairly raising prices to its resellers as it raises its regular tariffed rates, while large corporate customers enjoy fixed-rate long-term contracts.

Although other carriers, such as Sprint Corp., have been raising their tariffed rates along with AT&T, Sprint's resellers have enjoyed price protection in the form of long-term contracts, said Telegroup Chairman Fred Gratzon.

Ann Kroupa, AT&T's sales vice president for specialized markets, refused to comment directly on the pending cases. But, she added, AT&T remains "the carrier of choice" among resellers.

An ongoing problem, Gratzon complained, is that AT&T does not assign high-quality staffers to work with resellers. He said that at times AT&T staffers did not have computers and had been overwhelmed by the workload. "AT&T was not exactly putting Bell Labs on the job," he said.

BY DAVID ROHDE

LOCAL LOOP REGULATION

Court releases RBHCs from competitive mandate

BY JOANIE WEXLER AND BILL BURCH

Washington, D.C.

A recent court decision that relaxes collocation requirements on local Bell telephone companies might slow the delivery of services from competitors, observers said last week.

But they hastened to add that, because of the distributed intelligence of emerging high-speed networks, the ruling should not present any technical hurdles to competitive offerings that ride partially on the regional Bell holding companies' net infrastructure.

A U.S. court here has overturned a 2-year-old Federal Communications Commission mandate that said RBHCs must negotiate agreements that allow competitive access providers (CAP) to physically house, or collocate, their equipment in Bell company central offices.

The move flies in the face of myriad local competition gains over the past several years (see graphic, page 38).

The alternative to physical collocation would be for CAPs to link their own sites to the RBHC central office via high-speed networks — an option called virtual collocation.

If they do not already offer service in a given area, some CAPs might have to build their own facilities.

"What the ruling means is that the FCC can't require a Bell operating company to give up space on its own property. But the FCC can still mandate interconnection" between a CAP and a Bell network, said Cindy Schonhaut, vice president of government affairs in the Washington, D.C. office of MFS Communications Company, Inc., an Oakbrook, Ill.-based CAP.

Some Bells will offer physical collocation anyway, she predicted.

Indeed, MFS secured physical collocation agreements with New York Telephone Co., NYNEX Corp. and Sprint-Centel of Illinois before the FCC ordered physical collocation, said Andrew Lipman, senior vice president of legal and regulatory affairs for MFS.

However, Mike Zivich, telecommunications manager at Spiegel, Inc. in Westmont, Ill., said the ruling will stall competitive services from new players.

"Obviously, not being able to collocate will slow the CAPs down and cost them money. Whether it eliminates their ability to compete or not remains to be seen," he said.

If an RBHC chooses to kick a CAP out of

See **CAPs,** *page 38*

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Speedy wireless net to go live in Silicon Valley

BY JOANIE WEXLER

Los Gatos, Calif.

Metricom, Inc. plans to launch the fastest radio net service to date later this month in California's Silicon Valley.

DILWORTH

The company's 77K bit/sec Ricochet Micro Cellular Data Network is an early hopeful for accommodating bandwidth-heavy communications for applications such as graphics exchange and groupware.

The net attacks competitors such as ARDIS, RAM Mobile Data and Cellular Digital Packet Data (CDPD) suppliers on both the speed and cost fronts. Ricochet costs a flat fee of about $3 to $30 per month, depending on what speed guarantee the customer specifies.

RAM Mobile maxes out today at 8K bit/sec, while ARDIS and CDPD run up to 19.2K bit/sec. ARDIS' Personal Messaging service costs $69 a month for 200 messages, while field service personnel average about $100 a month for ARDIS net use, the company said.

RAM Mobile messaging costs $135 per user per month for unlimited messaging, though $25 and $75 packages are available that put ceilings on usage.

CDPD provider McCaw Cellular Communications, Inc. says users will likely pay an average of $35 a month for its service.

Ricochet is in beta test at nine sites, including Visa International, which is using the $3-a-month option for giving point-of-sale terminals wireless access to the company's VisaNet wired transaction net, said George Barby, vice president of acquirer services. Metricom is working with Visa to build metropolitan-area Ricochet nets around the world.

The Metricom architecture — which calls for small base stations to be tacked onto street lights, telephone poles or the sides of buildings — appealed to Visa because it "doesn't require an upfront infrastructure investment," Barby said. "You just slap in capacity as you need it."

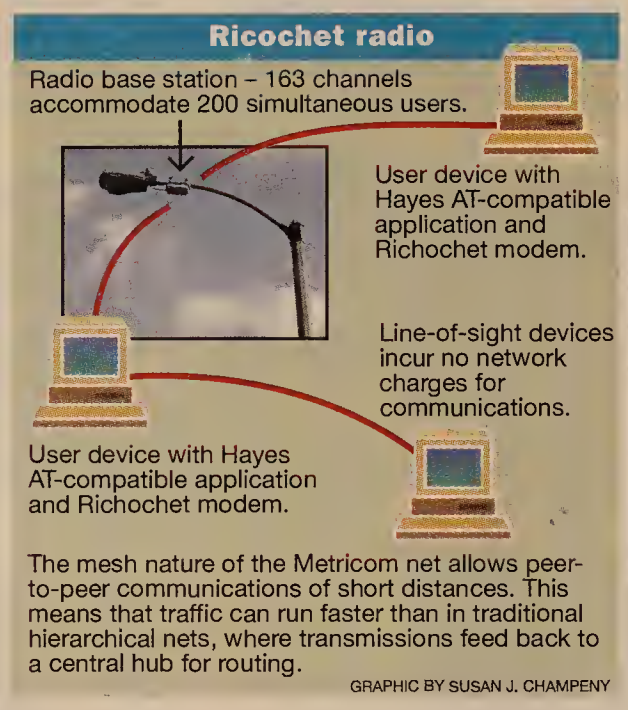
"We're not building a nationwide infrastructure right out of the shoot," to keep costs down, Metricom President Robert Dilworth said. He explained that a Silicon Valley user traveling to Lincoln, Neb., will simply be out of luck for Metricom access.

Dilworth said Metricom is taking a campuslike approach for users who are "locally mobile." According to BIS CAP International, a Norwood, Mass.-based research firm, only 13% of the 27 million U.S. mobile workers today leave the metropolitan area.

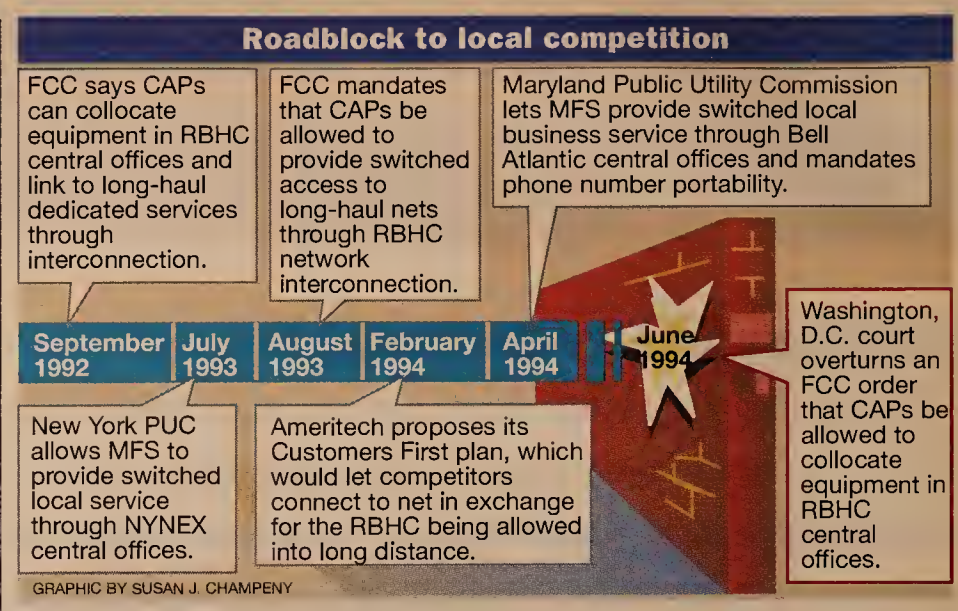
Metricom said it expects to have commercial service in 30 major U.S. cities by the end of 1996. Other beta sites are the City of Cupertino, Compaq Computer Corp., Hewlett-Packard. Co., Lotus Development Corp., Microsoft Corp. and Stanford University.

Craig Mathias, principal at Farpoint Group, a consultancy in Ashland, Mass., questioned what the Metricom net offers over wired alternatives, given that Ricochet does not hand off calls among base stations. This means users must remain fairly stationary and are likely to have access to a phone line. "ISDN is coming out, and V.34 modems will accommodate 100K bit/sec," he said.

Users within receiving distance of each other will be able to communicate peer-to-peer outside the Metricom net of base stations and incur no net charges, as Ricochet modems can communicate directly with each other.



Only Metricom manufactures Ricochet modems, which cost $495. Brian Salisbury, president of Metricom's Wireless Data Division, said the firm is considering licensing the Ricochet protocol. Most applications with interfaces to a standard Hayes AT command set will work across the Metricom net, he said.



CAPs

Continued from page 35

its central office, Schonhaut said, "we have to figure out how to transition our circuits without interrupting service" and make operational changes — tasks that consume time and money.

Zivich agreed, though, that virtual collocation makes sense from an RBHC perspective. "What right do you have to go into someone else's house and rearrange the furniture?"

Leading CAPs MFS and Teleport Communications Group, Inc. asserted that they could continue to provide special access to their customers with no discernible service disruption using the virtual alternative.

Alan Stewart, president of Network Interface Corp., a Chicago consultancy, agreed. "I believe the CAPs can do as much with virtual collocation as they can with physical collocation."

Stewart said that this is because with older, less intelligent switches, it was more important to have the equipment physically next to each other from a management standpoint. But now, "why have two boxes in one place if it works just as well with them at different locations with a smart network in between?"

With virtual collocation, CAPs can also avoid the $50,000 to $60,000 that RBHCs charge to build equipment enclosures within central offices.

To date, the CAPs have physically collocated at roughly 150 central offices out of thousands throughout the country.

For CAPs wishing to retain an RBHC central office presence, the FCC could find ways to ensure physical collocation's survival.

The FCC had granted the RBHCs pricing flexibility in exchange for allowing CAPs to physically collocate their equipment (see commentary, page 39). If a local exchange carrier refuses to provide physical collocation, MFS has asked the FCC to revoke that pricing flexibility.

Instead of threatening the RBHCs, the commission could also employ regulatory incentives to persuade the RBHCs to support physical collocation, according to Brad Ramsay, deputy assistant general counsel for the National Association of Regulatory Utility Commissioners.

And Alan Pearce, president of Information Age Economics, a telecommunications research firm in Washington, D.C., said the decision does more to push Congress to give the FCC a new regulatory paradigm.

"The courts are getting involved in policymaking and interpreting the [Communications] Act of 1934 strictly. This makes it hard for the FCC to deal with the burgeoning competitive trends," he said.

Southwestern Bell to be first out of the box with 555

BY DAVID ROHDE

St. Louis

Network managers in Southwestern Bell Corp.'s five-state territory will have first crack at a valuable new set of telephone numbers that can be used to provide free or paid services to customers and prospects.

Southwestern Bell is close to introducing a service based on 4,000 new seven-digit phone numbers starting with 555, confirmed Guy Miller, the carrier's area manager for interindustry market management. The new 555 numbers were designed as an alternative to 900 and 976 numbers for companies interested in offering information services, but they have generated tremendous interest for a wide variety of applications. (*NW*, Feb. 28, page 1).

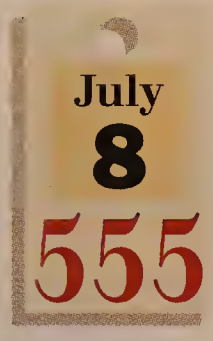
The numbers will be easy for organizations to advertise because the same seven-digit code will work across multiple area codes. Instead of the traditional method of number assignment by individual Bell operating companies, each number will be assigned by Bell Communications Research to individual entities for use regionally or nationally.

As expected, the Industry Numbering Committee recently approved guidelines for assignment of the 555 numbers. Bellcore subsequently said that the guidelines would go into effect Friday, July 8.

Organizations already lining up for the service include newspapers with information services, firms with customer help lines and government agencies that want to charge a small fee for answering inquiries, Miller said. Some organizations are even planning automatic fax-back and downloading options, he added.

Other local exchange carriers (LEC) report similar stirrings and are starting to develop 555 programs, as well.

"I know that we're taking a look at some sort of service offering," said Richard Round, staff administrator of forums for GTE Telephone Operations in Irving, Texas. "I'm hearing that [555] is going to be a very popular number, as I knew it would be."



Under Southwestern Bell's service, the information provider will be charged a set fee each time a 555 number is called. In turn, the service provider can either charge a fee to the caller — to make the number a money-making proposition — or eat the cost to make it an alternative to an 800 number.

Many of the 555 calls are likely to come from outside a given organization's local calling area, so the per-call fee will be set high enough to compensate for toll charges it might have otherwise earned on some of the calls, Miller said. That means the charge is likely to be higher than a typical 800 service offering from a LEC or a long-distance carrier.

A typical user, Miller said, is the *St. Louis Post-Dispatch*. The newspaper will give readers access to an information service at a cost of 50 cents per call.

To avoid the kinds of problems that have plagued pay-per-call services such as 900 and 976, Southwestern Bell at first will maintain control of all billing, with limits on the maximum per-call charge to the customer. Down the road, this restriction may be relaxed.

Miller urged any network managers who think their organization could make use of a 555 number to file an application with Bellcore by July 8. All applications received by then will be treated as if they arrived at the same time, he said, so multiple applicants for the same number will have an equal shot at it.

After July 8, new applications will be treated on a first-come, first-served basis.

RATE & TARIFF MONITOR

by Eric Paulak

Now you see it; now you don't

Just when you thought you were going to get a break on interstate access pricing, it's snatched away by the courts. Maybe.

In a move that undid two years of regulatory posturing and legal battles, a Federal Court of Appeals in Washington, D.C. overturned an FCC order requiring all Tier 1 local exchange carriers — the Bell companies and GTE — to allow competitive access providers (CAP) to collocate equipment within carrier facilities (see story, page 35).

What's the impact on zoned pricing?

The FCC set up the special pricing allowance to compensate local exchange carriers (LEC) for revenue lost to collocation and the strengthened competitive position of the CAPs.

Without collocation, there's no need to give the LECs any pricing flexibility that's to their advantage. And that means there's no pricing advantage for you either.

A little background: Before zoned pricing, the Bell companies were required to charge the same amount for a T-1 interstate access line, no matter where that line was within a state.

With zoned pricing, however, the Bells were allowed to set up three or four density zones that allow them to charge different prices based on economies of scale. Because US West does more business in Omaha than it does in Scotts Bluff, Neb., it can charge less for T-1 access in Omaha.

But currently, only NYNEX and Pacific Bell have differentiated prices for each zone in New York and California, respectively.

So, how's all this going to change now that collocation has been overturned? There are several possibilities in any sort of combination.

First of all, nothing will change. If that happens, the Bell companies will keep their zoned pricing and you'll still be able to take advantage of cheaper access in urban areas.

Another alternative was proposed by Teleport Communications Group — a leading CAP — within hours of the court's decision being handed down. They petitioned the FCC to revoke the zoned pricing allowance for all LECs that don't voluntarily offer collocation.

But prior to the FCC's collocation order, only three LECs had negotiated deals for voluntary collocation. They were Sprint-Centel of Illinois, New England Telephone and New York Telephone.

Since the collocation order, CAPs have moved into about 150 LEC central offices nationwide. If the LECs pull their collocation tariffs, the CAPs would have to pull their equipment from those central offices and connect just like any other customer.

Hank Levine, a Washington telecom attorney, said another possibility is that the FCC will order some type of virtual collocation or issue a new order that requires LECs to provide CAPs the "technical and economical equivalent" of collocation. In return, the FCC would allow the density zone pricing.

Virtual collocation is where the CAPs only provide the line to interconnect with the LEC's central office and the LEC provides the switch.

All these scenarios will play themselves out in the next six months. In the meantime, it's important to note that the same order that set up collocation — and was overturned — also set the density pricing. If the FCC chooses to overturn the tariffs for density zones, it could do so. Chances are, the agency won't do that unless a LEC revokes its collocation tariffs and tries to kick the CAPs out of its central offices.

If that happens in New York or California, your T-1 access prices could change, depending on what the rates were prior to zone density pricing. And any contracts you signed for those zoned prices would be void.

In one form or another, however, zone density pricing should stick around. It may go away for a short time while the collocation issue is figured out, but if the LECs meet the spirit of collocation by offering an equal interconnection, you should still be able to get the cheaper access rates in urban areas.

Paulak is associate publisher at the Center for Communications Management Information, a provider of rate and tariff information in Rockville, Md. He can be reached at (301) 816-8950, Ext. 327.

Resale

Continued from page 35

insist that resellers get their own carrier identification codes (CIC) — the five-digit abbreviations, such as "10288" for AT&T, that callers can use to choose a carrier. That will clarify the relationship between the user and reseller should a dispute arise as to which carrier the customer has chosen.

By contrast, AT&T allows resellers to use the much-advertised 10288 code, even though the user is technically the customer of the reseller instead of AT&T, according to Ann Kroupa, AT&T's sales vice president for specialized markets in Basking Ridge, N.J.

In addition, MCI will use "unbranded operators" who — using automatic number identification — can identify resellers through the CIC codes and answer customer queries using the name of the reseller. By contrast, AT&T operators answer queries from its resellers' customers with a simple "Welcome to AT&T" greeting, Kroupa said.

"If pressed on it, we certainly don't object to their identifying MCI as the underlying carrier," Dennis said. "But our customer is the switchless reseller, not the end user. So I think you could confuse the customers [if you advertise it's MCI]."

Finally, MCI is seeking resellers that will offer customers value-added services, such as credit cards, in addition to discounted rates. In fact, MCI prefers that resellers private-label their MCI offerings, much as they do with WilTel and other second-tier carriers.

©MCI Carrier Services Division: (810) 351-5300; Telecommunications Resellers Association: (202) 429-6601.

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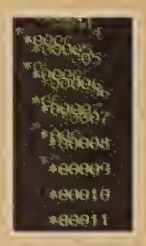

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SWITCHED DIGITAL SERVICES

DATABASES

Microsoft revs up next version of SQL Server

BY BARB COLE

Redmond, Wash.

Microsoft Corp. last week announced the next version of its SQL Server database, which will include built-in data replication, a graphical database administration tool and support for large amounts of data.

The announcement was Microsoft's first effort to clarify the database direction it will take since parting ways with Sybase, Inc., its longtime database development partner, earlier this year.

Code-named SQL 95, the new version will be available by year end. It will run on Daytona and come bundled with Starfighter, a graphical user interface-based tool for centrally managing databases.

Microsoft plans to tie Starfighter to SQL 95 using its Object Linking and Embedding (OLE) 2.0 technology — Starfighter's interface will be a collection of OLE 2.0 objects. The management software will enable systems administrators to replicate databases, among other things, by pointing and clicking.

Analysts said Microsoft faces a challenge in selling SQL 95 as an enterprise database.

Automated maintenance routines can be customized using Microsoft's Visual Basic for Applications programming language.

SQL 95 will support databases of up to about 100G bytes, according to Microsoft. Also, query performance has been improved, the firm said. SQL 95 will have broader support for messaging via Microsoft's Messaging Application Programming Interface.

SQL 95 will include new backup compression technology that will achieve transfer rates of up to 20G bytes per hour, Microsoft said. Also, administrators will be able to back up databases on CD-ROMs.

With this announcement, Microsoft takes aim at the high-end client/server mart and former partner Sybase. (Sybase will also soon release a Windows NT version of its SQL Server System 10 software.)

Users were enthusiastic about SQL 95, especially the replication features and Starfighter.

"The name of the game in the high-end database market is to provide additional services like replication and high-speed backup, and this product will have that," said Mohsen Moazami, president of Stanford Business Systems, Inc. in Culver City, Calif., who will test a beta copy of SQL 95. "We're excited because we see a lot of homegrown replication systems that are failing," Moazami added. "This product will be able to handle larger databases and will be faster."

Analysts gave good reviews to the new technology in SQL 95, but said Microsoft faces a challenge in selling SQL 95 as an enterprise database.

"[The product] doesn't have the depth yet," said Bobby Cameron, senior analyst at Forrester Research, Inc. in Cambridge, Mass. "There's no support for heterogeneous databases beyond Open Database Connectivity, and the network management facilities are designed for handling low transaction volume."

✆Microsoft: (206) 882-8080.

ISVs to decide if Microsoft scores Touchdown in messaging arena

BY ROCHELLE BRODER

Seattle

One of the issues that will determine whether Microsoft Corp.'s new messaging and workgroup software will be able to compete with Lotus Development Corp.'s Notes is if Microsoft can get enough support from third-party hardware and software vendors.

Microsoft is expected to demonstrate its Microsoft Exchange client/server messaging system, which is code-named Touchdown, at its Information Exchange user conference here this week. The software is expected to start shipping by year end (*NW*, June 13, page 6). Analysts predict, however, that Microsoft will not be able to meet that deadline and that Microsoft Exchange will not ship until at least the first quarter of next year.

Support from hardware and independent software vendors (ISV) between now and then for the messaging system will be vitally important to Microsoft, said Sharon Durland, research analyst with Aberdeen Group, Inc. in Boston. She said that not even a vendor of Microsoft's size can develop by itself all of the products, including work flow and other mail-enabled applications, that large electronic mail users need.

Exchanging information

A sample of vendors and areas in which they will support Microsoft's Exchange.

- **Action Technologies** — Work flow automation
- **Boston Software** — E-mail gateways
- **Collabra** — Electronic conferences
- **Delrina Corp.** — Electronic forms
- **Keyword** — Document viewing
- **Sequent** — E-mail gateways
- **SoftSwitch** — E-mail gateways and switches
- **Watermark** — Image and fax distribution and access
- **Worldtalk Corp.** — E-mail gateways

COMPANY PLEDGES

Among the companies that have already pledged their support for Microsoft Exchange is Sequent Computer Systems, Inc., of Beaverton, Ore. It will use the Microsoft show to announce a new messaging strategy based in large part on Microsoft Exchange.

Sequent, best known for its Unix servers and on-line transaction processing systems, is going to position itself as a provider of systems integration services to companies seeking to create enterprise messaging networks and links to trading partners via electronic data interchange.

David Rodgers, vice president for emerging technology at Sequent, said Microsoft Exchange offers the power and sophistication needed to run increasingly complex messaging architectures. Much of this comes from Microsoft Exchange's integration with Microsoft's Object Linking and Embedding (OLE) 2.0 technology, which provides the container needed to easily attach and transport files across an enterprise and beyond, he said.

LINKING EXCHANGE

Sequent will work to link its Microsoft Exchange servers with high-end Sequent servers running X.400 and electronic data interchange software from vendors such as Isocor of Los Angeles, Marben Products, Inc. of Los Gatos, Calif., and the Boston Software Works, Inc.

A number of ISVs also plan to integrate their products with Microsoft Exchange.

■ Collabra Software, Inc. is extending its Collabra Share agent technology to let users run electronic forums in Microsoft Exchange environments, according to Eric Hahn, president and chief executive officer of Collabra.

■ Burlington, Mass.-based Watermark Software, Inc. will integrate its Watermark Professional for clients and Watermark

See **Touchdown**, *page 42*

BRIEFS

Vantive Corp. of Mountain View, Calif., last week announced new features for its client/server-based **customer information software.** Vantive System 3.0 adds a variety of database search mechanisms and tools for building links to automatic call distributors and other devices. Users can now also create self-help customer service applications to which customers can connect via dial-up modems. In July, the company is expected to ship replication technology for linking the databases used by its applications.

Vantive System 3.0 runs atop either Oracle Corp. or Sybase, Inc. databases on Solaris, AIX and HP-UX servers. It supports Macintosh, Windows, Motif and OpenLook clients. Pricing starts at $55,000 for a 10-user license. The replication software will start at $10,000 per license.

Vantive: (415) 691-1500.

The Software Edge, Inc. of Colorado Springs will announce today a new version of its problem- and change-tracking software that integrates with a popular versioning package for **client/server application development.** The company's Defect Control Systems 2.1 will work with Intersolv, Inc.'s PVCS configuration management software. This will let corporate developers attach problem reports from end users or help desks to individual sections of application code.

The new version will also include support for Microsoft Corp.'s Microsoft Mail and Lotus Development Corp.'s cc:Mail. The Windows software will be available in July, with pricing starting at $495 per user for clients and $995 for a mail server.

Software Edge: (800) 695-2303.

OSIware, a Vancouver **enterprise messaging** vendor, last week announced that it is changing its name to **Infonet Software Solutions.** The company was already a subsidiary of Infonet Services Corp., a provider of value-added network services. Infonet Software sells X.400 and related products.

Infonet Software: (604) 436-2922.

Oakland, Calif., **object database** vendor **Montage Systems, Inc.** recently announced that it, too, is changing its name. It will now be called **Illustra Information Technologies, Inc.** This is the company's third name since it was founded in 1992 — its original monicker was Miro Systems, Inc. The company changed its name to Montage after learning that a German company was already named Miro, and then renamed itself Illustra after discovering an American firm was already using Montage as a product name.

Illustra: (510) 652-8000.

Computer Mail Services, Inc. (CMS) of Southfield, Mich., recently changed the pricing for its **electronic mail gateway** for linking users of Lotus Development Corp.'s Notes application with users of electronic mail packages on Banyan Systems, Inc. VINES networks. Users can now buy licenses for as few as three V-Bridge for Notes servers, starting at $1,495 per three-server license. Previously, the company sold only an unlimited server license for $4,995. The software resides on both Banyan VINES and Lotus Notes servers.

TELEPHONY INTEGRATION

Giving client/server applications a voice

BY ADAM GAFFIN

Tools that add telephony and voice functions to client/server applications are growing in size and sophistication, but some analysts and end users predict many of them may wither on the vine.

Recent weeks have seen announcements of new products that turn push-button phones into miniclients of networked applications or incorporate voice objects into documents and files.

Case in point: Big Sky Technologies, Inc. has announced Remark MultimediaClient for Windows, which lets end users embed voice annotations in documents and electronic mail messages. When teamed with the company's existing telephony server, it lets users send the annotations to other network users, even those who do not have audio cards in their computers — when they click on a voice attachment, they hear the message through their phone.

AIMING SKY-HIGH

Big Sky was spun off as a separate company from Simpact Associates, Inc. of San Diego and will oversee development of software that links Lotus Development Corp. Notes to telephone servers. That move was partly aimed at making the new venture more attractive to potential investors, company officials said.

Separately, Campbell Services, Inc. recently announced plans to integrate its calendaring and scheduling software with telephony applications developed by Novell, Inc. and AT&T. And Lotus recently introduced Phone Notes for connecting push-button phones to Notes databases.

Ron Murphy, vice president of information systems (IS) for CNL Group, Inc., an Orlando, Fla., investment firm, hopes Phone Notes can help him streamline business processes.

In one application now under development, CNL workers with computer problems would dial up and be connected to a Phone Notes server that would guide them through voice menus. As they make selections, the server would generate a Notes form that would be directed to an IS staffer who can help resolve the problem.

A similar application would guide CNL brokers and customers to data on company services and products.

However, Murphy said, "[Phone Notes] is an interim solution." CNL is already looking at giving its larger brokers copies of Notes so they can tap directly into databases. Murphy said he is very interested in public Notes networks — such as the one recently announced by Lotus and AT&T — as a way to reach customers and brokers.

VERBAL COMMANDS

He predicted that, ultimately, software would become sophisticated enough to respond directly to voice commands from callers, eliminating the need for push-button programs.

Susanna Opper, president of the Susanna Opper and Associates groupware consultancy in Alford, Mass., cited other limits for such applications.

"Within the next 12 to 24 months, most busy business executives are going to carry their own PCs," with which to plug into office applications on the road, she said. This alone will dramatically reduce the need for push-button interaction, she said.

"If this thing takes off, I'm going to be really surprised," Opper added.

Opper said applications such as Phone Notes could be useful to companies rolling out enterprise groupware nets. Few firms can give everybody access to groupware at once, but phone access "might be the scaffolding" for building the net, she said.

A voice in the crowd

Recent telephony application announcements:

Big Sky's Remark MultimediaClient for embedding voice objects in documents and E-mail.

Campbell Services' plans to link OnTime scheduling application with AT&T and Novell telephony services.

VocalTec, Inc.'s VocalChat 2.0 voice mail and dictation application for NetWare.

Dartmouth to turn loose homemade mail via the Internet

Could commercialize BlitzMail, too.

BY KEVIN FOGARTY

Hanover, N.H.

When Dartmouth College couldn't find the Macintosh-based electronic mail system it needed during the mid '80s, it decided to build one itself.

And now, after six years of tweaking and tuning the application, the college has decided to go into the E-mail business.

Last month, Dartmouth started making its BlitzMail system available for free over the Internet (see graphic). The school hopes the application will build up enough of a following that the college will be able to sell future versions commercially, something it tried to do once but abandoned.

The school started developing its own E-mail application in 1987 after deciding that commercially available E-mail systems with Macintosh clients were either too hard to use or could not support Dartmouth's thousands of users, said Rich Brown, manager of special projects for the college's computer services department.

The system developed at Dartmouth can take mail directly off the Internet and distribute it to various computer systems, including Unix and Macintosh computers, and uses proper names as E-mail addresses.

ON-LINE CAMPUS COMMUNICATION

The product, written during a two-month blizzard of activity by Brown and four others, has become ubiquitous on Dartmouth's campus.

Dartmouth students are all wired into a campuswide network via AppleTalk connections from their dorm rooms. E-mail has become a primary means of communication on campus, linking 17,000 Dartmouth students and staff — even those who do not use computers.

"If you hate computers and swear that in your entire tenure here you will never turn one on, we will send your E-mail to be printed, and you will get it by paper mail," Brown said.

BlitzMail, which ran originally on the college's Hitachi America, Ltd. mainframe, now runs on six NeXT Computer, Inc. servers and a Digital Equipment Corp. Alpha server running OSF/1. The servers are connected to each other and the rest of the network resources via Ethernet.

BLITZMAIL FEATURES

BlitzMail is a store-and-forward system that uses a single, proprietary directory called Dartmouth Name Directory (DND). DND connects to other directories via the Computer and Communication Service Office Nameserver Protocol, a protocol commonly used by Internet user group and resource-locating applications.

In addition to user names, DND stores user delivery preferences and will automatically route messages to the system of their choice, whether it be a Macintosh, Unix or PC system.

BlitzMail includes a flat-file message storage system that is adequate for as many as 3,000 users. It uses an Oracle Corp. database for larger E-mail systems, such as Dartmouth's.

Dartmouth's E-mail system is distributed over seven NeXT and OSF/1 servers, one of which is dedicated to the DND.

After five years of development, Brown and the college actually tried to release BlitzMail as a commercial product last year.

They were unsuccessful, however, because the college lacks the sales force and integration staff it would need to sell and install the system.

"We would all have had to buy suits," Brown said of his department.

"For most commercial products, a 1,000-person license would be $30,000 or $40,000, [and] the users would want us to install it and integrate it," he said. "We're just not set up to do that."

Dartmouth's BlitzMail system is available free over the Internet at ftp.dartmouth.edu in the /pub/mac/BlitzMail/Export directory. You can also use the Universal Resource Locator to reach the directory: ftp://ftp.dartmouth.edu//pub/mac/BlitzMail/Export.

CE Software's QuickMail upgrade to go by the rules

BY ADAM GAFFIN

West Des Moines, Iowa

CE Software, Inc. this week will announce a new version of its QuickMail software that will give Macintosh and Windows users the ability to sort and route incoming electronic mail.

Version 3.0 comes with software called MailManager with which users can specify rules for how their mail is handled depending on a variety of categories, including sender, subject, priority, date and key words within the message text.

The Macintosh version of QuickMail 3.0 will also include key word searching of messages or message folders as well as an increase in the number of messages and folders a user can have at one time.

The Windows version will let users launch applications for attached files from directly within a message, rather than having to first exit their E-mail program.

QuickMail 3.0 is scheduled to ship in August. Pricing will start at $649 for a 10-user license.

DAVINCI UPGRADE

Meanwhile, DaVinci Systems Corp. of Raleigh, N.C., last week announced an upgrade to its remote E-mail application.

The software, eMail Remote 2.5, adds support for Novell, Inc.'s Remote Message Handling System (MHS), which lets users of laptops and remote personal computers exchange mail either by modem or by connecting their computers directly to a local-area network.

The new version also incorporates other Remote MHS features, such as support for public data networks and for Novell's NetWare Global MHS addressing, directory synchronization and file attachment standards.

Pricing starts at $199 for a single Windows user and $169 for a single DOS user.

✆CE Software: (800) 523-7638; DaVinci: (919) 881-4320.

Touchdown

Continued from page 41

Image Server imaging software with Microsoft Exchange via OLE and other technologies, according to Peter Brumme, Watermark vice president of sales and marketing.

The product integration will enable users to distribute images and facsimiles via Microsoft Exchange.

■ Keyword Office Technology, Ltd., whose KeyView 4.0 software allows Document viewing, reading, saving and printing over a network, will also be integrated with Microsoft Exchange, said Dal Bryant, Keyword's president and CEO.

■ SoftSwitch, Inc. of Wayne, Pa., will add support for Microsoft Exchange on its Enterprise Mail Exchange (EMX) messaging switch so users of the Microsoft E-mail system will be able to swap messages with users of other systems.

EMX will provide users with directory synchronization, as well.

■ Action Technologies, Inc. in Alameda, Calif., will announce plans for its object-oriented ActionWorkflow System to automate and route Microsoft Exchange-based applications, according to Action Technologies officials.

The ActionWorkflow System already runs on Microsoft Windows NT Advanced Server 3.1 and supports Microsoft specifications, such as its Messaging Application Programing Interface.

Senior Writers Kevin Fogarty and Adam Gaffin contributed to this report.

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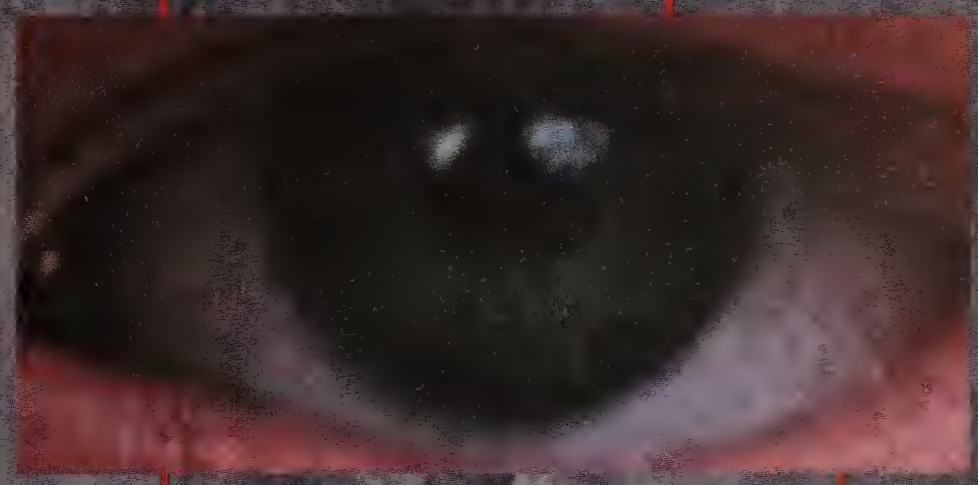

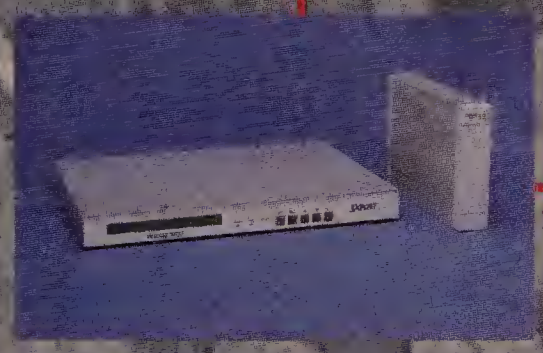

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DATABASE ACCESS

Intersolv serves up strategy for ODBC drives

BY BARB COLE

Rockville, Md.

Application development tool vendor Intersolv, Inc. over the next 12 months plans to release server-based ODBC database drivers designed to reduce network traffic and simplify driver administration.

The plans come in the wake of Intersolv's April acquisition of Q+E Software, Inc., a Raleigh, N.C.-based vendor of data access tools, including drivers based on Microsoft Corp.'s Open Database Connectivity specification. Intersolv plans to port the ODBC software it acquired, now available only on client systems, to servers accessible to multiple clients.

"You will only load one driver and set up security once," said Rowland Archer, vice president of Q+E Software product development at Intersolv.

Currently, a separate ODBC driver is installed on each client; the clients can then request data directly from host sources.

RELIEVING TRAFFIC

Archer said putting the drivers on servers will reduce net traffic because "you can queue up client requests to the host and send them from the server."

Server-based drivers will also allow administrators to stage data, which involves placing copies of commonly accessed information on the server. This reduces net traffic because data is passed once from the host to the server and accessed repeatedly by clients.

Intersolv drives ahead

The company plans to:

- Put ODBC drivers on servers running Unix, OS/2, Windows NT and Macintosh operating systems.
- Support joins across heterogeneous databases via ODBC drivers.

"There are many applications that can benefit from a server-based ODBC driver," said Ed Acly, director of software research at International Data Corp. in Framingham, Mass. "There are a lot of ways to exploit the server with this technology."

After its acquisition of Q+E Software, Intersolv shipped its Intersolv Q+E ODBC Pack for Windows NT, OS/2 and SunSoft, Inc. Solaris clients, and announced plans to port its ODBC drivers to Macintosh clients. The ODBC Pack lets users access more than 30 data sources from ODBC-enabled applications.

Intersolv is not focusing much development time on ODBC driver performance, despite reports that accessing data via ODBC is slow. "There is nothing about ODBC that makes it a bad performer," said Gary Greenfield, Intersolv's chief operating officer.

Red Brick targets retailers with new data warehouse

BY BARB COLE

Los Gatos, Calif.

Red Brick Systems last week announced a version of its data warehouse software designed especially for retailers that is optimized to reduce network traffic and ease installation.

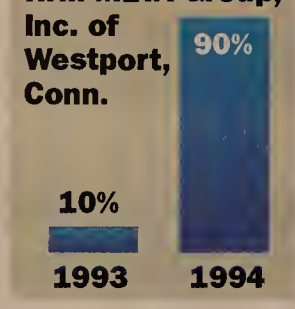
Retail Warehouse Pilot, based on the Red BrickWarehouse, includes an additional data model into which users can enter retail sales and marketing information from point-of-sale systems.

"Users plug their own data into predefined tables that we provide. From there, they build the relational objects that are necessary to store data in a warehouse," said A.J. Brown, vice president of marketing at Red Brick.

A data warehouse is a relational database that stores operational or historical data for decision support applications. By comparison, traditional relational databases are designed for transaction processing and record keeping.

The Retail Warehouse Pilot Kit reduces the amount of time it takes to implement a data warehouse from three months to one, according to Brown.

About 90% of the 2,000 largest U.S. companies are in the midst of data warehouse projects, compared with only 10% a year ago, according to market research firm META Group, Inc. of Westport, Conn.



In addition, he said the product cuts network traffic since it stores aggregations, or subtotals, of data on the server. These subtotals result in more efficient queries so less data is passed to clients.

"Other companies sell data models that let you plug in your own data to predefined tables, but this takes it one step further by providing the database to store that data," said Marc Myers, a principle at Quantum Solutions in Chicago. "This would be useful in industries where there are some standard data requirements," he added.

Retail Warehouse Pilot includes a client and server component. The server piece stores warehoused data and processes queries. The client component makes requests to the server and displays results to end users. It runs on a variety of Unix servers as well as DOS, Windows, OS/2, Macintosh and Unix clients.

The Retail Warehouse Pilot Kit costs $15,000 for a single server and unlimited clients. The $15,000 will be applied toward the purchase of Red Brick Warehouse, which costs $19,000 to $300,000.

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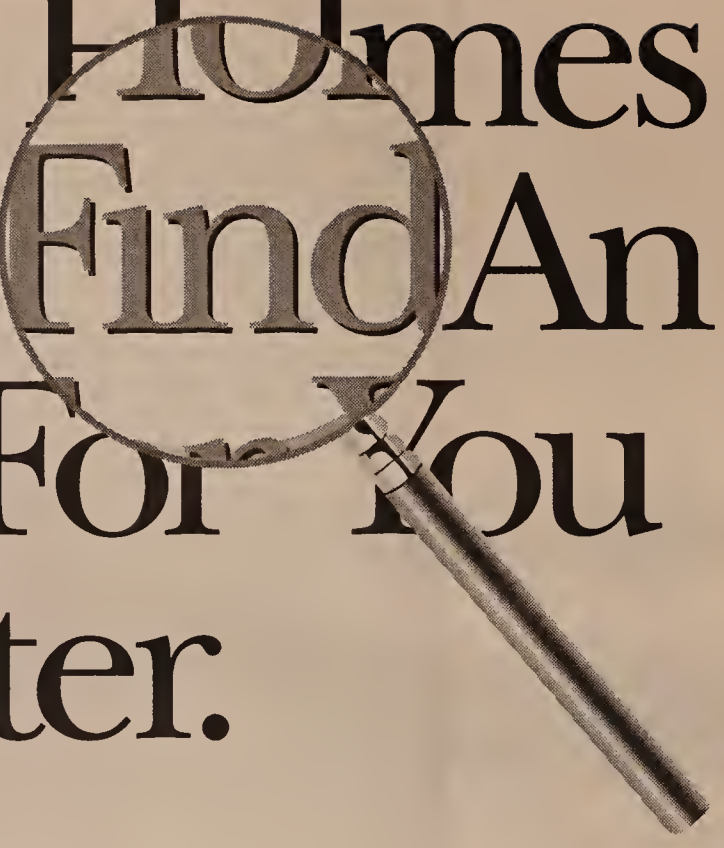

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EDITORIAL

The Shadow of Things to Be

There's a scene near the close of *A Christmas Carol* where Ebenezer Scrooge grovels at the shrouded feet of the Ghost of Christmas Yet to Come, whose skeletal finger points to a tombstone bearing Scrooge's name.

"Are these the shadows of things that *will* be, or the shadows of things that *may* be only?" Scrooge asks about this terrifying vision. "Men's courses foreshadow certain ends for which, if persevered in, they must lead. But if the courses be departed from, the ends will change. Say it is thus."

Scrooge's ultimate redemption shows that our destinies are not preordained. The choices we make today shape our future.

That message, sans Dickens' moral trappings, was resoundingly clear at last week's IT User Summit sponsored by *Network World* and Northeast Consulting Resources, Inc. (NCRI).

The IT leaders who took part examined five end states imagining the roles network and computing professionals *may* play in their corporations by the year 2000. If there was consensus on what lies ahead, it was that the future will probably be some combination of end states — an amalgam shaped by pivotal opportunities realized or missed in the years to come.

Therein lies the beauty of NCRI's Future Mapping process: It shows that rather than having to submit to a future cast in stone by technology trends and vendor decisions, you can, in Scrooge's words, sponge away the writing on the stone.

Four end states envisioned IT in a leadership role, empowering end users, enabling mass customization, driving reengineering or building global partnerships. Those end states "engage the imagination," as one senior executive who attended the summit stated.

They were also voted considerably more desirable — and in that order — than the end state seen as most attainable — one in which IT is viewed as simply a cost center buffeted by shifting economic winds.

The wake-up call from the Ghost of IT Yet to Come.

The case for "IT as a Cost Center" was the easiest to establish, fitting so neatly with economic pressures, short-term corporate and Wall Street thinking, and a pervasive skepticism about the value of technology investments. Asked what would be the best career move if this model comes to pass, one participant quipped: "Go work for the outsourcer."

What came across clearly to all of us who took part in the two-day program was that IT executives have to choose the role their departments will play in their companies and drive the events that will get them there — whether they are establishing virtual data networks, getting a handle on client/server management, building enterprise directories or embracing key standards.

That's the leadership challenge. The future can be thrust upon you, or you can choose the end and the course that will take you there. It is thus.

JOHN GALLANT jgallant@world.std.com

TELETOONS FRANK AND TROISE

THE BLUE VIEW

by Anura Guruge

Think carefully before taking channel-attached approach

Attaching multiprotocol bridge/routers to IBM mainframes directly through one of the mainframe's native high-speed I/O channels is the latest IBM-centric internetworking initiative now being pursued by bridge/router vendors — with the indefatigable Cisco Systems, Inc. leading the pack (*NW*, March 7, page 36). At first, there appears to be definite technical merit in channel-attaching bridge/routers. This initial perception could, however, be misleading. Careful evaluation of all the implications of this approach suggests that users should exercise considerable diligence before opting for this type of solution.

A direct channel-attachment scheme eliminates the need for an intermediary gateway, such as an IBM 37XX, 3172 or 3174, between the mainframe and the bridge/router-based multiprotocol LAN/WAN internetwork. This is a big plus, since having a gateway such as a 37XX or 3172 between a bridge/router-based internetwork and a mainframe has two obvious and significant technical shortcomings. To start, it adds an additional hop — and, consequently, some amount of delay — to every data path between the net and the applications running on the mainframe. In addition, the intermediary gateway constricts the potential data throughput between the network and the mainframe.

Mainframe channels, depending on whether they are traditional, copper-based, bus-and-tag channels or the fiber optic-based Enterprise Systems Connection II channels introduced in 1991, can run at 36M or 136M bit/sec, respectively. Bridge/routers today have to be attached to the mainframe gateway, such as a 3745 communications controller, via a LAN. This would typically be a 16M bit/sec Token Ring, the fastest local-area network type currently supported by 3745 and 3746 communications controllers.

Eliminating the intermediary gateway would also reduce costs. The potential cost savings of eliminating even a midsize 3745 with a channel-attached bridge/router could be considerable. Just the annual hardware and Advanced Communications Function/Network Control Program (ACF/NCP) software maintenance costs for a midsize 3745 could be in excess of $10,000. Factoring in lease costs could put the overall annual ownership cost of a 3745 into the $50,000-per-year range.

Thus, the prospect of replacing a 3745 with a channel-attached, high-performance, multiprotocol bridge/router is indeed very enticing. Unfortunately, there is a catch.

Channel-attached bridge/routers are not going to be able to act as 37XX gateways. To appear as a 37XX, a bridge/router would have to implement a Systems Network Architecture Type 4 Subarea Node (sometimes known as a PU Type 4). Cisco toyed with PU Type 4 in 1991 in its original five-phase SNA internetworking strategy. To its credit, Cisco withdrew from this ambitious goal in 1992, citing — to nobody's surprise — the considerable difficulties of trying to shoehorn all the code required to realize an SNA subarea node into a multiprotocol bridge/router. Bridge/router vendors are unlikely to want to tread down this rocky path once more (*NW*, June 13, page 53).

So at best, a channel-attached bridge/router is going to emulate a 3172 LAN interconnect controller and, at worst, a 3174 establishment controller. And herein lies the rub. Neither a 3172 nor a 3174 can match a 37XX in terms of the network size that can be supported or the value-added SNA functions routinely used by midsize to large-size SNA customers.

Certain SNA functions can only be realized via a 37XX running ACF/NCP. A good example is the SNA Network Interconnection facility that is used to realize transparent interoperability be-tween autonomous SNA nets. Another is the NetView Performance Manager capability that is widely used by large IBM enterprises to collect network usage statistics for producing network accounting and network billing reports. Customers that rely on such facilities will not be able to dispense with their 37XXs, regardless of the indubitable cost advantages of a channel-attached bridge/router approach.

Another consideration is the size of the SNA networks that can be supported with 3172 and 3174 gateways — or the bridge/routers emulating them. A 3172 can currently support 1,020 downstream SNA nodes (such as 3174 control units or Application System/400 minicomputers), while a 3174 can only support 254. A 3745 can, in theory, support at least 9,999 SNA nodes. By the judicious use of PC-based, LAN-attached physical unit concentrator gateways such as Novell, Inc.'s NetWare for Systems Application Architecture or IBM's OS/2 Communications Manager, a user could concentrate the number of SNA nodes in a larger net to work within the limitations imposed by a 3172 or 3174. Having to deploy such additional downstream gateways will, however, increase the total cost of the new network and could also have a negative impact on overall performance.

The key issue, however, is not the differences between a 37XX and a 3172 or a 3174. It is the difference between a 3172 and a multiprotocol bridge/router that is striving to emulate a 3172. Anyone who worked with SNA nets in the 1980s will remember the joys of SNA emulation devices. Although there have been some hugely successful products, like NCR Comten's 37XX alternatives, the SNA emulation market is not what it used to be. As a result, customers have steered away from channel-attached bridge/routers and stick with IBM gateways.

With mission-criticality at stake, one doesn't want to take chances on system reliability and availability. A channel-attached bridge/router may save you $50,000 per year. But one hour of unscheduled downtime between your mission-critical applications and your entire network could cost you $100,000.

The bottom line is very simple. On paper, channel-attached bridge/routers are indeed an attractive proposition. And in some cases, they will be just what the doctor ordered. However, before rushing to dispense with your existing gateway in favor of a channel-attached bridge/router, spend a few minutes comparing the equipment cost savings with the true cost of network downtime. You may conclude that the channel-attached approach isn't all it appears to be.

Guruge is an independent consultant specializing in internetworking and IBM network architectures. He can be reached at (603) 878-1303 or via the Internet at aguruge@mcimail.com.

USER FORUM

by Douglas Welch

Network automation can be risky business

In their race to implement totally automated, distributed computing systems, user companies have exposed themselves to considerable risk. The effort to eliminate the drudge work of network administration has produced a climate that allows near disasters such as the recent accidental deletion of user directories by an Arthur Andersen & Co. network operator using Lotus Development Corp.'s Notes (*NW*, May 2, page 1).

In some cases, it is possible to automate network systems so thoroughly that they have the ability to totally destroy themselves without any human intervention whatsoever. It is time to reevaluate the role of network administrators and put them back in charge of their networks so they can prevent incidents like that from occurring more frequently.

Arthur Andersen's network of distributed Notes servers was crippled by a combination of bad programming, overautomation and user error. While the human error involved in this case cannot be ignored, the reality is that more human intervention could have prevented the problem from spreading as far as it did.

Self-propagating systems remove much of the daily burden of updates and maintenance from net administrators. However, they should be programmed to request operator intervention when asked to perform a potentially destructive task. If the other Notes servers in the network had asked for confirmation before performing a massive deletion of users, a human operator would have been able to discover the problem and begin working toward a solution. Instead, the servers merrily performed their task by rote. As a result, the firm ended up with a crippled global net, rather than just one damaged server.

Network administrators are the backbone for most computer operations and will remain so for many years to come. Until computers reach the idealistic perfection of those on the Starship Enterprise, it is up to human operators to monitor and control them. Trusting your entire operation to a system that never asks for human confirmation, even in the face of potentially destructive operations, is asking for trouble.

Computers cannot think, and we should stop treating them as if they do. They can only perform the tasks we assign them. If our instructions are unclear or a new situation arises, network administrators need to be able to prevent these systems from doing harm to themselves. Net administrators must never forget that they are in control and that this authority brings with it many responsibilities.

There must be a balance between the level of automation and human intervention. Even trusted systems that seem to operate well must report their status and progress to the administrator. One never knows when some combination of events will lead to a failure. A system that may have been running for years will suddenly go awry when faced with some unknown element like a newer version of software or a different piece of hardware. Network administrators must be aware of the potential for conflict and prepare for it. The older an automated system is, the more likely it will crash unless it is upgraded and tested whenever new hardware or software is added to the net.

A related and growing problem is that of network administrator arrogance. A feeling of "I can't be bothered with that" seems to permeate many network departments. Faced with overwhelming workloads and demands, they automate systems merely to make them "go away." Once automated, these systems are forgotten until they fail, which is much too late.

Using automated systems can be an effective way of freeing more time for project work, but they still require a level of maintenance. Net administrators will soon find that a system will not be ignored. Welch's Law of Automation Perversity holds that such a system will fail at the worst moment and end up causing more damage than the problem it was designed to prevent.

Software manufacturers need to stop contributing to the problem, as well. Software that doesn't request operator intervention when it is needed most is worse than having to perform the task manually. While software vendors can try to simplify a network administrator's life, they must understand that there are some conditions that warrant halting a process and informing an operator. How many hours and dollars could have been saved if the Notes servers had requested confirmation before deleting thousands of users? Yes, the data was restored from backups, but isn't preventing the problem from happening better than recovering from it?

As a network administrator, you would be well advised to question each and every automated system you install. Are you getting status information? What type of maintenance is required and when? Does the system ask for confirmation on destructive or disruptive actions? If not, you might just find your company being featured on the front pages of the network industry trade publications — for all the wrong reasons.

Welch is a support analyst for a major entertainment corporation in Los Angeles. He can be reached via the Internet at 76625.3301@compuserve.com.

Letters

Electronic peephole

Regarding your article about the Federal Communications Commission's caller identification policy (May 23, page 1):

My strong belief is that my personal privacy will be enhanced by technology allowing me to have an electronic peephole in my electronic door so that I can see who is knocking before I open it. I fail to see how it invades anyone's privacy for me to see who they are before I open the door to them — if they don't want me to know who they are, they shouldn't knock on my door (or dial my number).

In addition, caller ID allows technologically advanced businesses to provide me with a much greater level of service by knowing about me when they answer my call and not having to waste their time (and my money — I pay for their time) asking me questions that they know the answers to, such as what I ordered last time, what my current credit status is, whether or not I am a preferred customer, or any other helpful information.

In short, if I am not trying to put something over on you and am honest and straightforward in what I am doing (and am not paranoid), then caller ID is a great feature and a major advancement in the protection of my privacy.

Larry Nebel
CEO
United Electronic Printers, Inc.
Fremont, Calif.

High or low?

I note a fascinating juxtaposition in the May 23 issue of *Network World*.

In their story "AT&T hikes long-distance pricing again" on page 28, Joanie Wexler and Eric Paulak chastise AT&T, MCI Communications Corp. and Sprint Corp. for raising basic tariffed rates. The story uses a graphic from the Modified Final Judgment Task Force (a coalition of the seven regional Bell holding companies) to show the three-year change in basic tariffed rates and average access charges.

Then, on page 35, Eric Paulak comments on AT&T's Contract Tariff No. 951, CustomNet, Option S. He notes that the discount on this contract is 36.95% to 38.25% off the basic tariffed rates and quotes an aggregator as saying that "AT&T's down in the gutter playing a price-gouging game."

Well, which is it? AT&T's prices can't be both unfairly high and unfairly low, now can they?

The fact is that long distance is a competitive market, and buyers who sit back and expect a deal to fall in their lap will pay higher prices than those who go out and expend some time and effort looking for the best deal.

David Lewis
Member of technical staff
AT&T Bell Laboratories
Holmdel, N.J.

Paulak replies: A long-distance carrier's — in this case, AT&T's — prices can be, and are, both unfairly high and unfairly low, just not to the same people.

In the case of the most current 4% rate hike — which came after two previous increases in less than a year — this is definitely unfair to small users, who are not covered by custom contracts that protect them from rate hikes. No one can or should plan for a 12.5% increase in most switched rates in less than 10 months, and that is exactly what AT&T and MCI have done.

Why is this unfair? This 12.5% rate increase does not respond to market conditions — not when AT&T is losing market share and should be doing whatever it can to gain it back; does not respond to operational costs — not when shareholders are told operating costs are down; and is definitely not in line with cost-of-living increases.

See **Letters**, *page* 55

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BUDGET $ SURVEY

Take a budget hike

Net managers project nominal budget growth, but it may not cover the costs of client/server initiatives or make up for staff reductions.

BY PAULINA BORSOOK

Unexpected expenses resulting from the pressures of downsizing to client/server networks and the thinning ranks of net staffs are forcing many net managers to delay or even curb projects.

Some relief, however, is in sight: Users are projecting budget increases of about 6% — and, in some cases, as high as 19% — for fiscal 1995, according to a *Network World* survey of 356 network executives.

For many, even modest budgetary hikes will not be enough to help those users choking in the current corporate climate of ever-increasing expectations. Users said they are struggling to provide higher levels of service and better response times, and are being asked to offer access to greater numbers of users with increasingly bit-hungry applications — but generally without an increase in budget or staffing. Despite projected budget increases, the majority of survey respondents still believe many projects will be relegated to the back burner, or never see the light of day.

Other major findings of *NW*'s 1994 Annual Budget Survey are:

- On average, combined capital and operating budgets for 1995 are expected to rise about 6% to $13.7 million.
- For fiscal 1995, average capital equipment budgets — for those companies that maintain separate capital and operating budgets — are forecasted to jump 19% to $16.4 million.
- Companies will continue to fund other departments with separate net budgets to the tune of $13.5 million on average next year.
- Forty-six percent of money earmarked for equipment purchases will be used to buy local network and LAN interconnection gear.
- More than eight out of every 10 users surveyed agreed they are being asked to provide more net services with less staff and financial resources.

Roughly one-third of the respondents said they've held back on major expenditures this year quite often, while half said they did occasionally. Most don't expect significant change next year, as 29% expect to hold off significantly on projects in 1995.

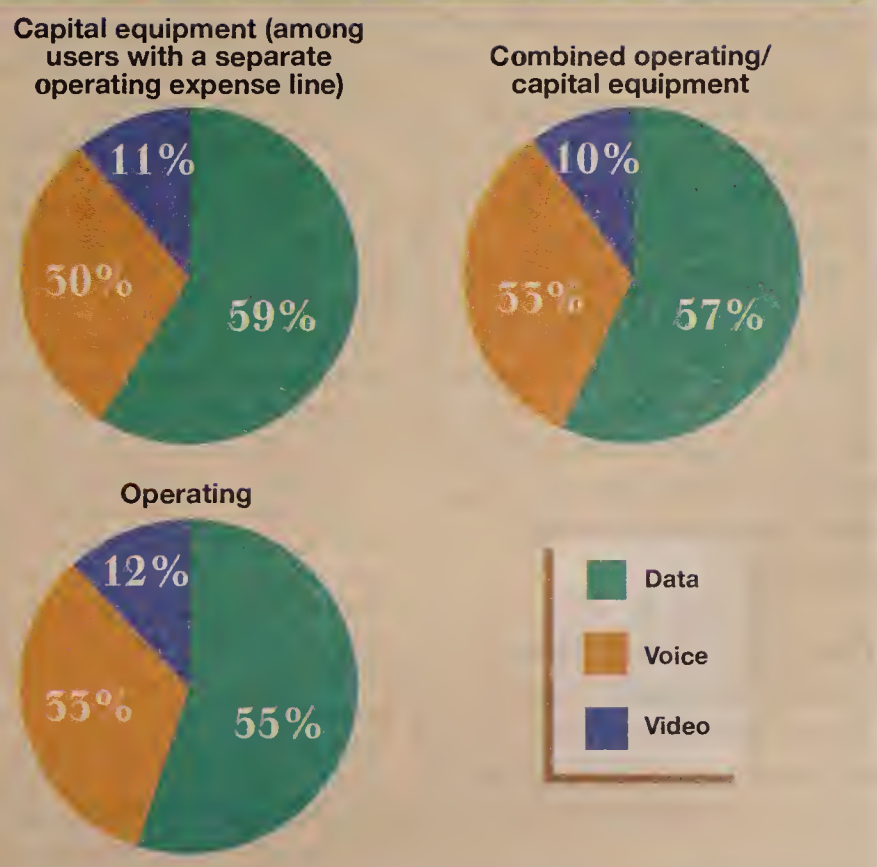
Continued on page 52

Budgets at a glance

For data, voice and video expenditures

Type of budget	Actual 1994 (millions)	Percent change	Projected 1995 (millions)
Capital equipment (among users with a separate operating expense line)	$13.8	19%	$16.4
Combined operating/ capital equipment	$12.9	6%	$13.7
Operating	$21.3	5%	$22.3

Budget allocation by net traffic type



In conducting this year's budget survey, *Network World* asked respondents what impact separate departmental network budgets have on their ability to set and enforce corporate networking standards.

What follows are their answers. We're interested in learning where you stand on this issue, too. Drop us a message through the Internet at cbruno@world.std.com., E-mail us via MCI Mail at 390-4868, or fax your response to us at (508) 820-1103. Please include your name, title and company.

"Departments do their own thing and get to allocate their own budgets and can get things done faster."

▲ ▲ ▲

"It allows for departmental standards, which may not be in line with corporate standards. This affords a greater deal of customization for each department, making things easier for the end user...who may, however, run into integration problems in using the corporate network."

▲ ▲ ▲

"We can't have a set of corporate standards. Each department chooses its own hodgepodge of networks."

▲ ▲ ▲

"A moderate impact. It forces us to make sure each department is in step with each other."

▲ ▲ ▲

"Makes it hard because if they have control of the money, they can do whatever they want – sometimes to the detriment of the net as a whole."

▲ ▲ ▲

"Can't tell them what to buy. Drives up the cost; no leverage for group discounts."

▲ ▲ ▲

"If you do that, you're in for a big headache because everyone has their own network, and it won't work."

Continued from page 51

Further, information systems professionals said they must cost-justify their every move more now than ever before. Most network professionals would likely understand the frustrations of Kevin Huber, vice president of MIS at Entertainment Data, Inc. in Beverly Hills, Calif.

"The network *is* the company, but the network is the bottleneck," Huber says. "Information is our business, yet everything we do must be justifiable." Entertainment Data takes real-time box-office receipts from movie theaters in Europe and the Western Hemisphere and feeds data from the database to such clients as studios, producers and film distributors.

DARK SIDE OF DOWNSIZING

The rush toward downsizing, whether in eliminating mainframes or reducing staff, has not necessarily reduced the demands placed on network managers. While mainframes and the staff that maintained them may be eliminated, the users that once relied on big iron still have to be tended to.

Big bucks

On average, $13.8 million is spent on communications products and services by departments outside the network or IS realm.

Yet the savings from dumping the mainframe may not have been used to increase the IS budget to take care of these orphaned users. Tony Zionkowski, network manager/systems engineer at Westinghouse Savannah River Co. in Aiken, S.C., says that as downsizing took place, "budgets were supposed to come with them." That is, IS staffers from the central data processing organization were supposed to follow, "but they didn't."

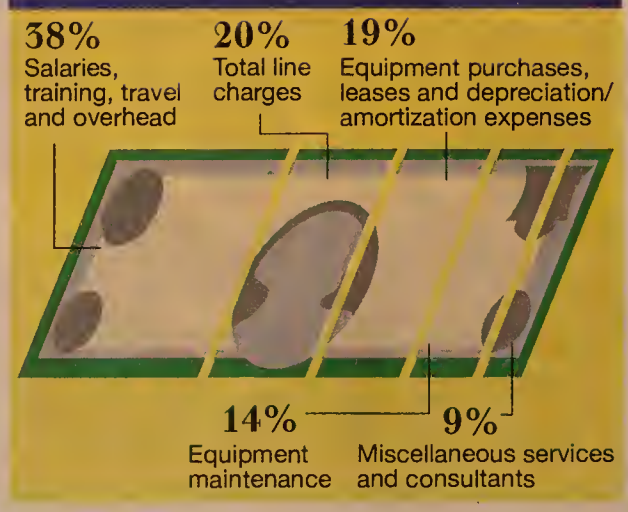
And many IS departments are discovering that the savings found in eliminating hardware are equalled if not exceeded by the increased labor costs in the complex world of client/server applications.

Christopher Teeter, associate partner in Andersen Consulting's Network Solutions practice, says "nobody ever said client/server is cheaper. It's a very complex task that creates communications-intensive applications that can link business partners and clients to each other."

Upper management at some companies, stunned by the difficulty and cost-overruns of client/server installations, have became wary of risking ambitious new information technology solutions. "Credibility is the most important thing," says Entertainment Data's Huber. "Otherwise, you can't get the money to do what you need. You may know what you want, but you need to be able to demonstrate that the money won't go into a networking black hole."

Harley Arnett, chief information officer at Foster Ousley Conley in Walnut Creek, Calif., has been able to put together a cost-effective state-of-the-art client/server installation that spans the country. His secret? He built his network on standard hardware — Dell Computer Corp. servers and 3Com Corp. communications gear — and saved on the software side by implementing Microsoft Corp.'s Windows NT Advanced Server (NTAS) instead of labor-intensive Novell, Inc. NetWare. Uniform hardware and software reduces maintenance and support costs; Arnett says NTAS was 25% less costly to install than NetWare, and its domain-centric simplicity should keep labor costs down. Further, the software allows Foster Ousley Conley to maintain a lean MIS staff at headquarters, where all network management can be performed for the remote regional sites where there are no MIS staffers.

Divvying up the budget dollar



And since there haven't been any wrong turns with the project, Arnett has gotten the go-ahead to implement an ambitious remote-imaging application he believes will pay for itself within six months. Other network managers might envy Arnett's free hand, but they can learn a lesson from the importance he placed on paying attention to costs throughout his network design.

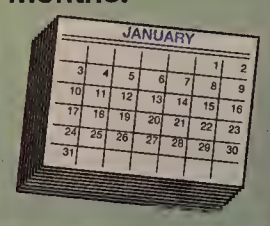
BELT-TIGHTENING

Survey evidence finds that the majority of respondents have had to scale back to some degree on network projects this year, and the majority also predict the same will hold true next year, too.

Some managers cope with this scarcity of resources by using triage with their network needs: Because they can't acquire everything they need all at once, they update servers one year, acquire high-powered routers the next and improve their backbone in the third year.

Andersen's Teeter, who is more optimistic, says some corporations, however, have realized "infrastructure is not a dirty word," meaning that investments in networking can reduce overall corporate expenses.

The average payback period required for approval of major network purchases is 17 months.



He also says another way to solve the problem of not having enough money to solve networking tasks is to "partition the net into geographic or organizational slices. Establish an architecture." In other words, pilot projects in small regions and once the project has demonstrated its worth, proliferate it throughout the organization as resources allow.

PAYBACK TIME

Regardless of the limits to their resources, network managers still have to justify purchases. Respondents said that the average payback period for network projects or purchases is about 17 months. Entertainment Data's Huber would agree, saying he needs to prove net return on investment within 12 to 24 months.

As for capital depreciation, Teeter says that in Andersen's practice, the consulting firm has seen average capitalization times for equipment drop from between five and seven years to between 36 and 60 months.

Huber capitalizes his gear on a three-year cycle, which is reasonable given that "net technology leaps every year. If it can't pay for itself or provide indirect payback in that time period, it's not the right choice." He expenses everything less than $2,000, which covers most run-of-the-mill communications gear except for big-ticket items such as routers. Foster Ousley Conley's Arnett uses a similar strategy, expensing items costing less than $500.

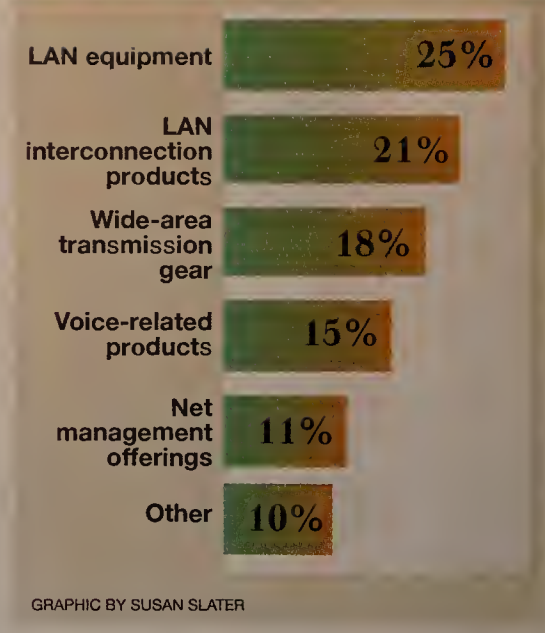
Interestingly, with regard to payback periods, 53% of respondents said the payback period has remained constant in the past two years. But 26% indicated it has decreased by an average of 10 months, while 16% said it increased by an average of five months.

NITTY-GRITTIES

In the survey, 65% of respondents reported separate budgets for capital and operating expenses, 31% indicated they use a budget that combines operating and capital expenses, and just 3% said they have an operating budget only.

Respondents who have separate budgets for capital and operating expenses project they will have $16.4 million to work with next year for capital purchases, an increase of 19% over this year's amount. Slicing up the projected

1995 budget spending breakdown



GRAPHIC BY SUSAN SLATER

capital equipment budget for next year, respondents plan to allocate 30% to voice services, 59% to data projects and 11% to video expenditures.

Among those sites with combined operating and capital equipment budgets, users expect budgets to rise 6% in 1995 to $13.7 million, up from $12.9 million this year. In the study, fiscal year 1995 budget allocations break down to 57% for data projects, 33% for voice services and 10% for video expenditures.

For those 3% of respondents with operating budgets only, the average budget is expected to rise 5% in fiscal 1995 to $22.3 million. That budget pie will be cut up into a 55% chunk for data, 33% for voice and 12% for video expenditures.

Salaries, training, travel and overhead will account for about 37% of fiscal 1994 and 1995 budgets; equipment purchases, leases and depreciation: 19%; line charges: 20%; equipment maintenance: 14%; and miscellaneous

services and consultants: 10%.

Roughly half the respondents (46%) indicated that communications expenses charged back to individual departments had increased during the past two years, while about one-third said it has not wavered. This is expected to change little in 1995. But more interesting is determining how to make those chargebacks.

Teeter says that with "the network seen as a profit center, expenses are following revenues." For example, in a financial services company, traders who hog network resources would be metered $6,500 per month, while an investment banker on mahogany row in the same organization would be charged $800 per month. "But consumer products companies found they were spending more on the [chargeback] reporting, than they were saving with the chargebacks. It wasn't worth it."

It does remain a question whether implementing intricate chargeback schemes is worthwhile. According to Jack Eberhart, telecommunications analyst with the General Services Administration in Washington, D.C., the value-added reseller that helps with GSA networking has not yet automated the process of tracking costs on a per circuit basis, instead delivering monthly paper printouts of needed network metrics. "It takes an hour or two of highly paid staff to sort this through. We can't do large-scale histograms, can't load the data into spreadsheets," which would enable the GSA to get a better handle on its network budgets. But creating these chargeback schemes is costly and difficult, which is why, he says, the VAR keeps saying, "We're working in it."

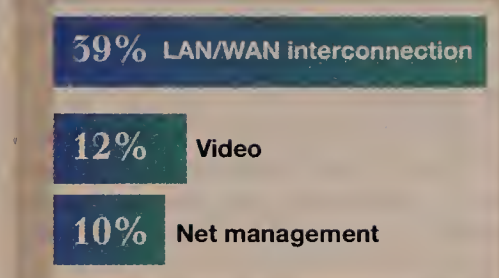
Ron Olsberg, network manager at Sandia National Laboratories in Albuquerque, N.M., says his organization has found a way around the problem: Instead of charging a per-seat cost for each user, the lab has begun in effect charging a flat-rate network tax on the dollar amounts flowing through each of the lab's projects. This removes problems with tracking capitalization costs and allows networking expenses to be averaged out equitably.

Curiously enough, outsourcing is not a major matter of concern in these lean times. Only 25% of respondents strongly agreed that "There is evidence that the networking department has to compete for business outsources." In fact, Derek Lawrence, manager for net planning at American Cyanamid's medical group businesses in Pearl River, N.Y., sees outsourcing as a way to make do with less. "Outside services can perform hardware maintenance and other repetitive tasks at a lower cost. They know the issues [involved with these tasks]. That way we can channel resources to staff projects that are strategic to our business."

Continued on page 54

Big ticket items

The three most prevalent areas in which users plan to increase spending next year:



Finding the right way

***Network World's* 1994 Annual Budget Survey probes for budget trends of network technology's leading users.**

This year's survey, which was conducted from March through April, is based on 356 responses from a randomly selected sample of 3,000 network managers who subscribe to *NW*.

To gain a statistically representative sample of network users, we selected company sites across a range of industries and regions: 25.8% hailed from the government sector; 18.5% of respondents identified themselves as manufacturers; and 11.5% are from the educational sector. Banking/finance and business/professional services each accounted for about 8% of the survey base, and health care organizations made up another 7% of the mix. Lower numbers of users from transportation, utility, wholesale/retail, insurance and agriculture/mining/construction filled out the mix.

First Market Data Research of Austin, Texas, conducted the survey based on phone interviews with network managers; First Market screened respondents seeking those individuals who best met our profile for enterprise net managers.

On average, respondents said they support 2,078 users at their site and have overall budget responsibility for six sites.

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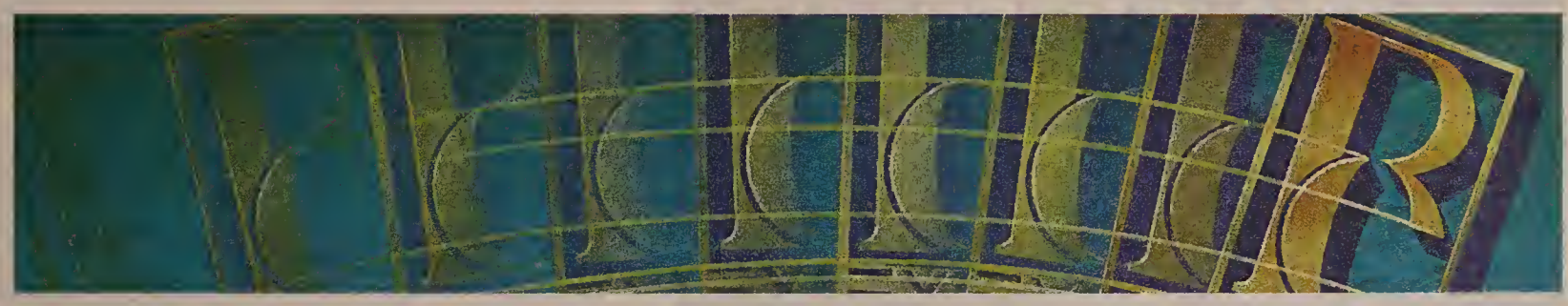

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Continued from page 53

Even if organizations are not turning to outsourcing, survey respondents indicated that an average of almost $13.8 million is being spent in 1994 for communications in other departments, with an average of $13.5 million expected in 1995. American Cyanimid's Lawrence wouldn't see this as a problem, for he "sees this trend as highlighting negotiation and project management skills within job functions."

In other words, network managers can position themselves as in-house consultants, making their expertise available organization-wide on a project-by-project basis. This way, network managers can help other departments create solutions that provide better and more cost-effective interconnection throughout an organization and — through group-purchasing discounts — provide better economies of scale.

THE FUTURE

Looking ahead to next year, respondents were asked to identify products or technologies in which they plan to significantly increase spending. LAN/WAN integration products pulled 39% of the vote, followed by video, which took 12%, and network management, which garnered 10%.

On another front, 44% of respondents said the advent of high-speed switched services is motivating them to lean toward migrating away from leased lines. Arnett might qualify: He just replaced 56K bit/sec leased lines with frame relay circuits over the same paths — at no extra cost.

In a similar vein of seeking alternatives to leased lines, some managers are looking to the Internet — Huber, as a way around the high costs and regulatory tangles of dealing with European post, telegraph and telephone administrations; Lawrence, as a way to get a jump on the Information Superhighway until the real thing, whatever that turns out to be, gets built.

But many managers feel that if they had money to spare, they would spend it on training. Sandia Labs' Olsberg says, "We spend too much time on babysitting and documentation. Education would be worth it for both end users and staff."

Huber would agree. "We'd spend extra money to get net training," he says. "We don't know enough about ATM and frame relay, and we're leery of consultants."

Or, as Lawrence says, "Training takes precedence above all else."

Borsook is a San Francisco-based writer. She can be reached via the Internet at loris@well.sf.ca.us.

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Help desk

Continued from page 2

NetWare 3.11 network. I would like to know how to connect the Macintoshes to the local-area network. Is it is a simple matter of upgrading to NetWare 3.12 and adding network interface cards to the Macintoshes?
Joe Pescatello, Boston

Caryn Gillooly, senior editor at *Network World*, replies:

It is not necessary to upgrade to NetWare 3.12 to bring your Macintoshes into NetWare — Macintoshes are supported within NetWare 3.11. All you need is Novell's own NetWare for Macintosh 3.12 software loaded on your NetWare 3.11 or NetWare 3.12 server and an Open Data-Link Interface driver on the Macintosh client.

The server software is compliant with Apple Computer, Inc.'s AppleTalk Filing Protocol, letting all Macintosh applications run on the NetWare server. NetWare for Macintosh also supports AppleTalk Phase I and Phase II and the Simple Network Management Protocol.

All this ensures that the Macintosh user on a NetWare LAN sees files stored on the NetWare server as familiar Macintosh icons and can access those files with the familiar Macintosh interface. And, PC users see Macintosh folders and file icons in the native format of the operating system each is running locally.

On the other hand, if you have upgraded to NetWare 4.X already and only have a handful of Macintosh users to connect to the LAN, you need not buy any additional software. NetWare 4.X includes a five-user version of NetWare for Macintosh within the network operating system itself.

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Letters

Continued from page 49

As to prices being unfairly low, the only ones saying that are aggregators and AT&T's other competitors. If AT&T is truly engaging in predatory pricing, let those being affected fight it out in court.

Meanwhile, AT&T is offering a good deal for small users with its CustomNet Option S contracts, which are worth consideration.

Be warned, however, that if AT&T's competitors take the carrier to court and win, those great deals could disappear.

Data market exists

I just finished reading your article "Relational DBMS network education has only just begun" (May 23, page 1). The tips in the graphic "How to make databases more network-capable" especially impressed me since there are some current activities in the telecommunications field that very much relate to the subject.

The FCC Common Carrier Docket No. 91-346, Inquiry into Intelligent Networks is considering rules defining the means by which third parties can access the capabilities of the intelligent network. It is this access capability that will provide the means for databases to be more network-capable in the ways you describe. Much progress is being made in the area of voice call handling. It's called the Advanced Intelligent Network, but it doesn't accommodate data.

Meanwhile at the Information Industries Liaison Committee, which was set up to handle these kinds of third-party access issues, Issue 44, which addresses the need for data network access to the intelligent network, is struggling to get the support of the telecommunications industry. Since GeoNet is involved in the issue, we are preparing a contribution to the Committee T1S1 for the July meeting. However, we all know that a solution via T1S1 takes years, especially without enthusiastic telecommunications industry support.

You might ask, "What about support from database vendors and users?" There are no database vendors on the Issue 44 Task Group, and if any have representatives on T1S1, they are not, to my knowledge, addressing the issue. For the Fortune 500 users, this is probably a nonissue since they have long since abandoned the public switched net to build their own private data nets. As for the rest of the users, they don't have the ability to participate.

All of this is why your DBMS article was so encouraging. Now, maybe some of the network provider marketing people will believe that there really is a market for data.

Don Berteau
Manager of business development
GeoNet, Ltd.
Vero Beach, Fla.

Fault-y logic

I enjoyed Mark Gibbs' column about hackers (May 16, page 24), but I take exception to one statement he makes: "If you have weak security and any external connections at all, hackers may get into your network and cause trouble. But the fault is yours for having poor security."

What I don't like is Gibbs' implication that the victim is at fault. If a network is broken into, it is not the fault of the network administrator. If my bicycle is stolen because I didn't lock it, it is not my fault. If a woman is raped, it's not her fault simply because she was jogging in the park in the middle of the night. In all cases, fault lies with the criminal.

Our society has been brainwashed to believe that if something bad happens to us, it's our own fault — we misplace responsibility for people's actions, and it shows in our written and oral communications.

I do agree that if you know something bad could happen, you should take preventive action (secure your network, lock your bicycle and avoid the park late at night), but if something bad *does* happen to you, it's not necessarily your fault. To point a finger at someone and say, "It's your fault your network was broken into; you have terrible security" is not an entirely accurate statement, and it misplaces responsibility for the negative actions of another.

I probably would not have felt compelled to write if Gibbs' last sentence had said something like, "If your network is compromised by a hacker, you should see the need to reevaluate his security measures...."

Nevertheless, I understand the point of your article and found it good reading.

Bruce Jenkins
Superintendent, Network Software Analysis Branch
Space and Warning Systems Center
Peterson Air Force Base, Colo.

Gibbs replies: While you are absolutely correct that the criminal is responsible for the break-in, I still maintain that the fact that a break-in was possible is the network manager's responsibility. It wasn't the net manager's fault in the sense of him or her causing the theft to happen. But it was the net manager's fault that the break-in could, and indeed did, happen.

Regarding your statement that "If my bicycle is stolen because I didn't lock it, it is not my fault:" If you know that there are thieves about (or even that they are possibly about) and you don't bother to lock your bicycle, just try getting the insurance company to pay up.

Regarding your comment that "Our society has been brainwashed to believe that if something bad happens to us, it's our own fault:" On the contrary, I think that society brainwashes people into not taking responsibility for their actions. How often do you hear "It wasn't my fault?" All the time. We cushion people who won't take responsibility for their lives in a thousand ways.

"Regarding your comment that '...if something bad does happen to you, it's not necessarily your fault:" interesting position. If you are at Peterson Air Force Base, then you may well work in a secure environment. Try having a security breach in your computer systems and then see how well that point of view goes down.

Regarding your suggested sentence, "If your net is compromised by a hacker, you should see the need to reevaluate your security measures:" And so you should, but you were still negligent.

My intention was not to absolve criminals and ne'er-do-wells, but to allocate responsibility. Webster's New World Dictionary *defines fault as "failure to have or do what is required; neglect; ...responsibility for something wrong." I'm the last one to let anyone off the hook for their misdeeds, but I don't think anyone should or can be excused for their negligence.*

Future shock

I read Scott Bradner's article on the "mythology of the Internet" and enjoyed every bit of it.

Thanks to Bradner for standing up for all of us who believe that the Internet has a relation with the future that is more intimate than some people believe.

Leo Irakliotis
Research assistant
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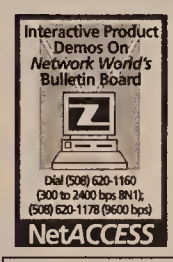

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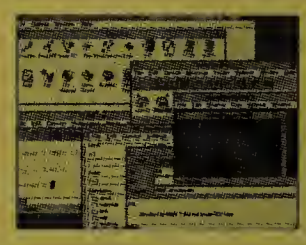

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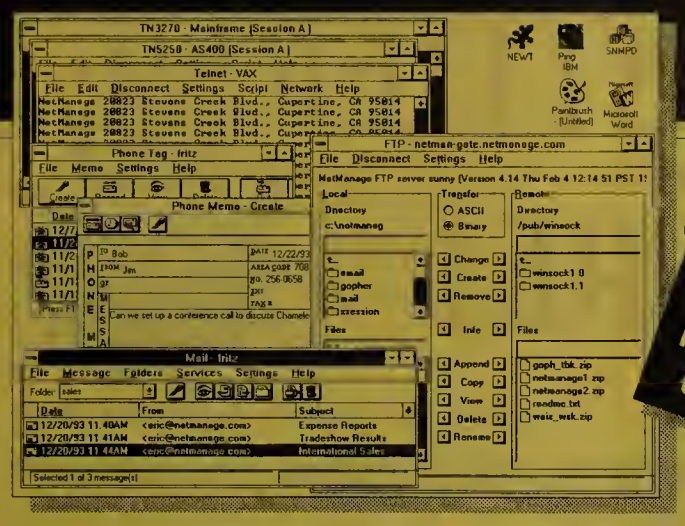

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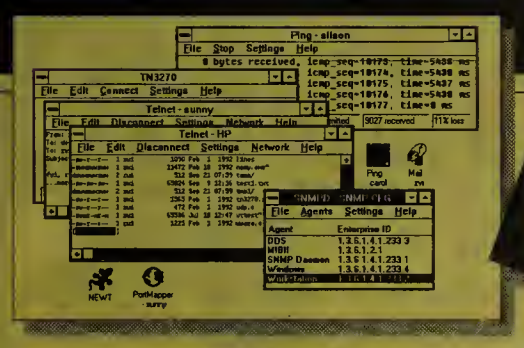

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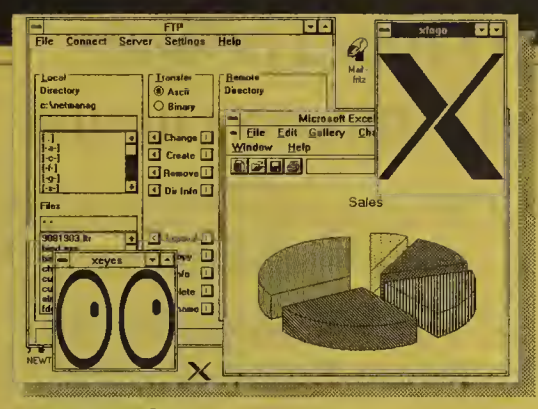

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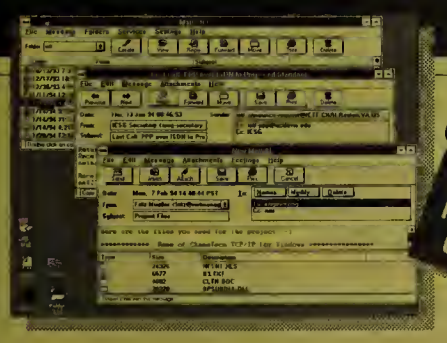

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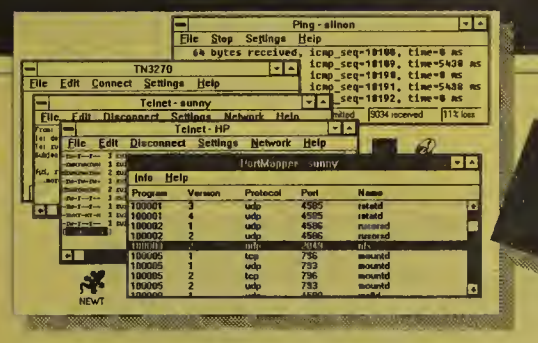

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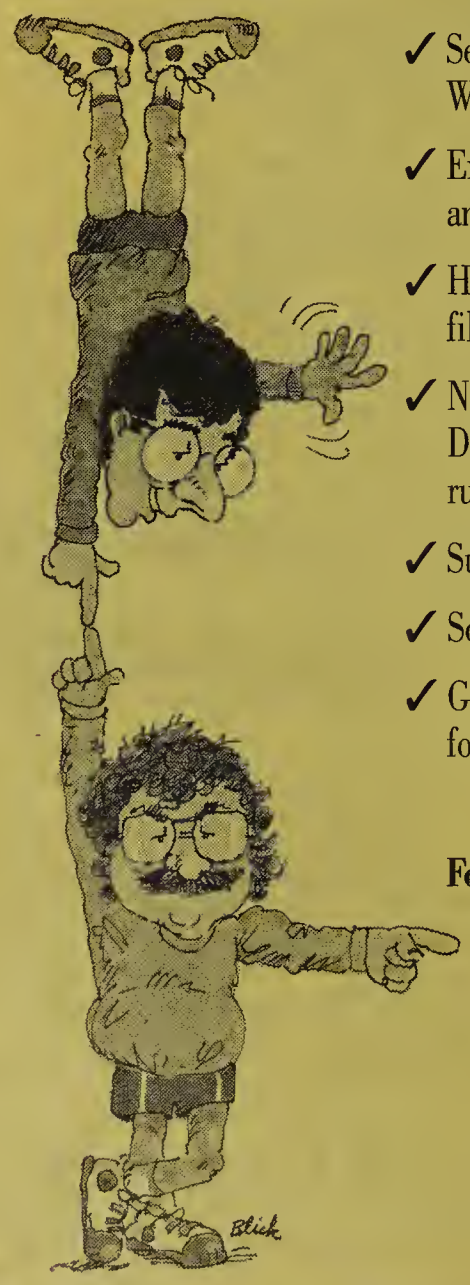

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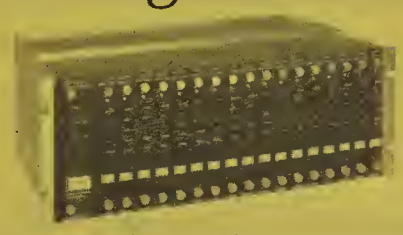

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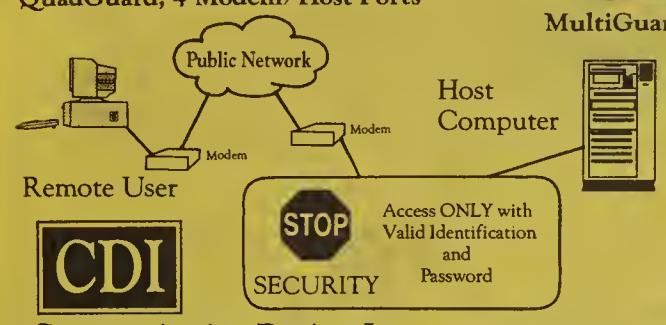

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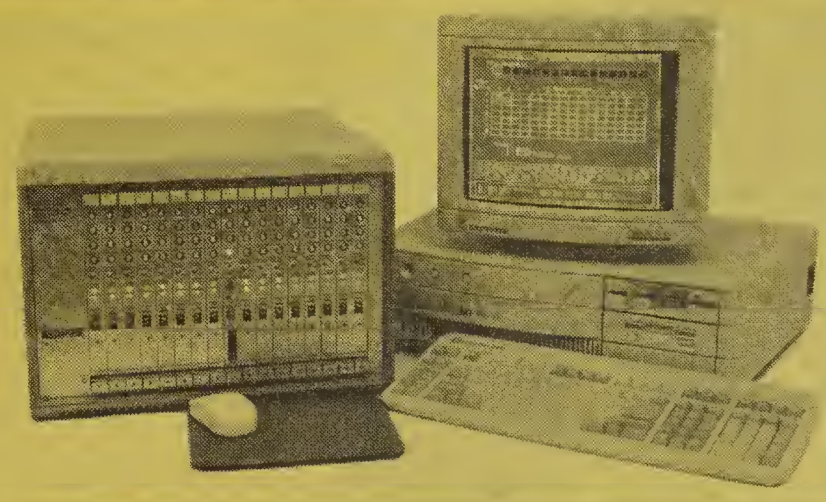

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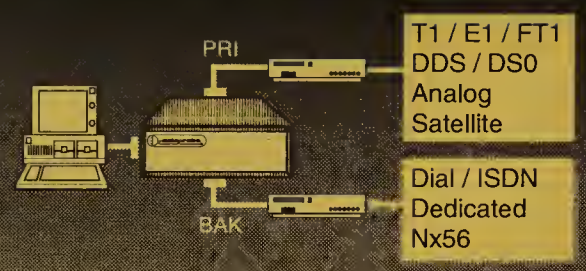

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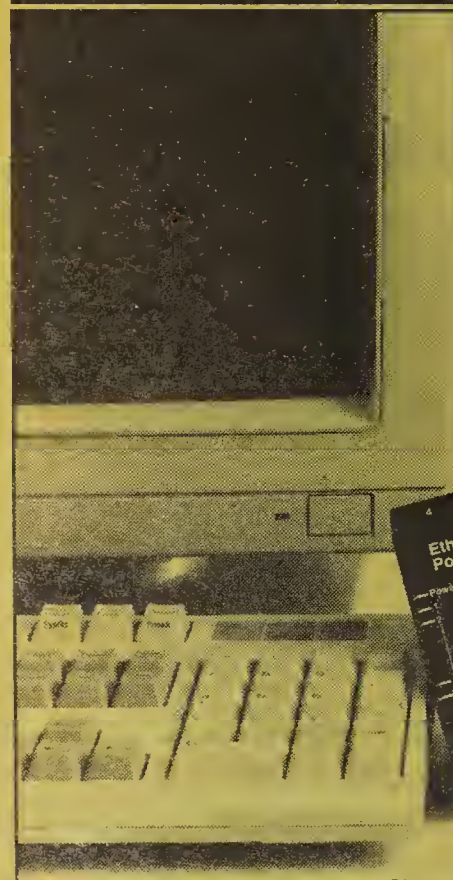

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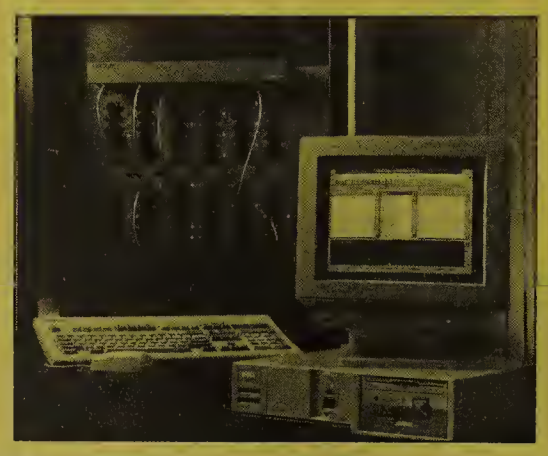

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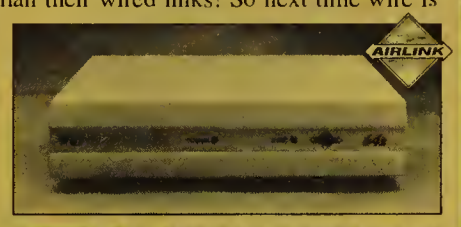

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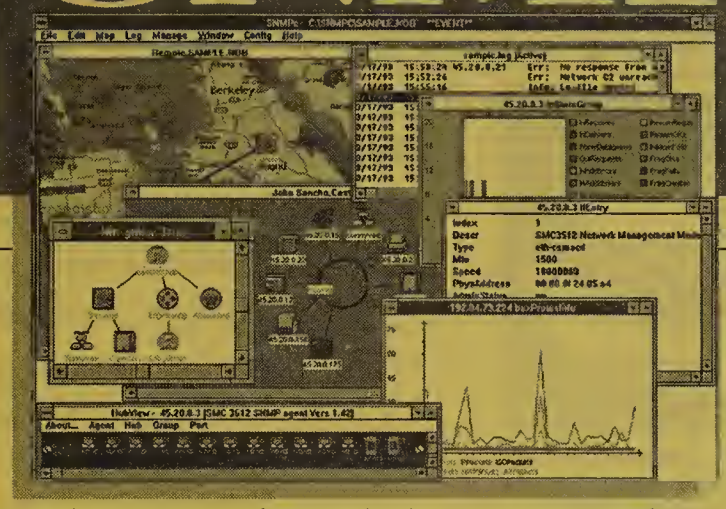

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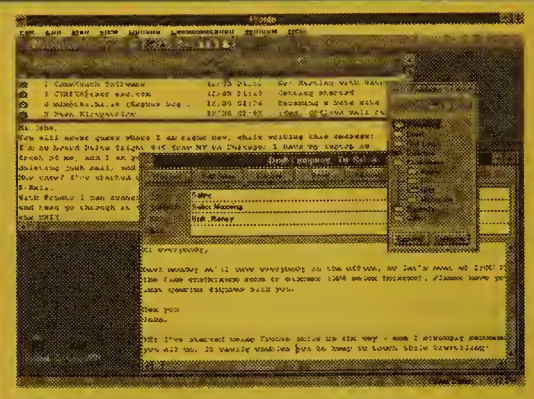

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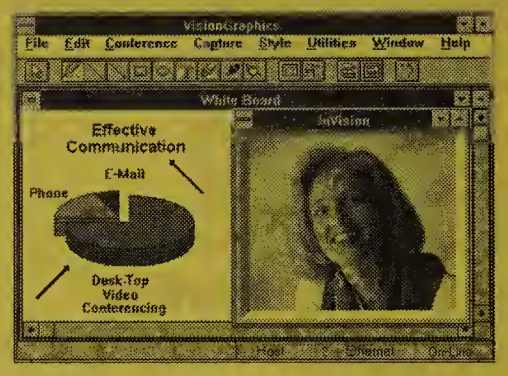

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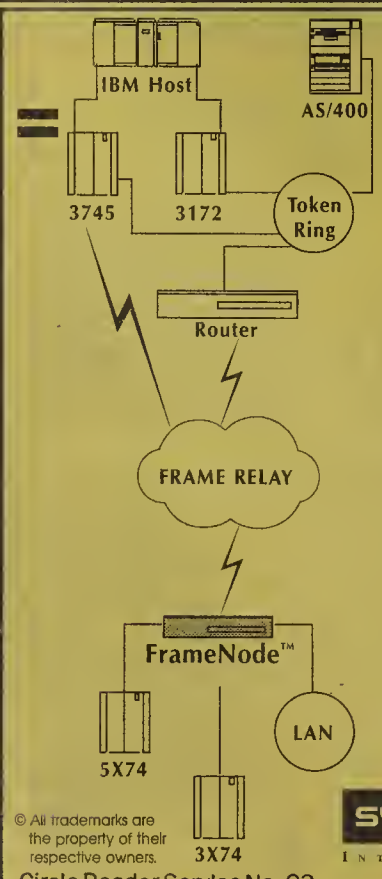

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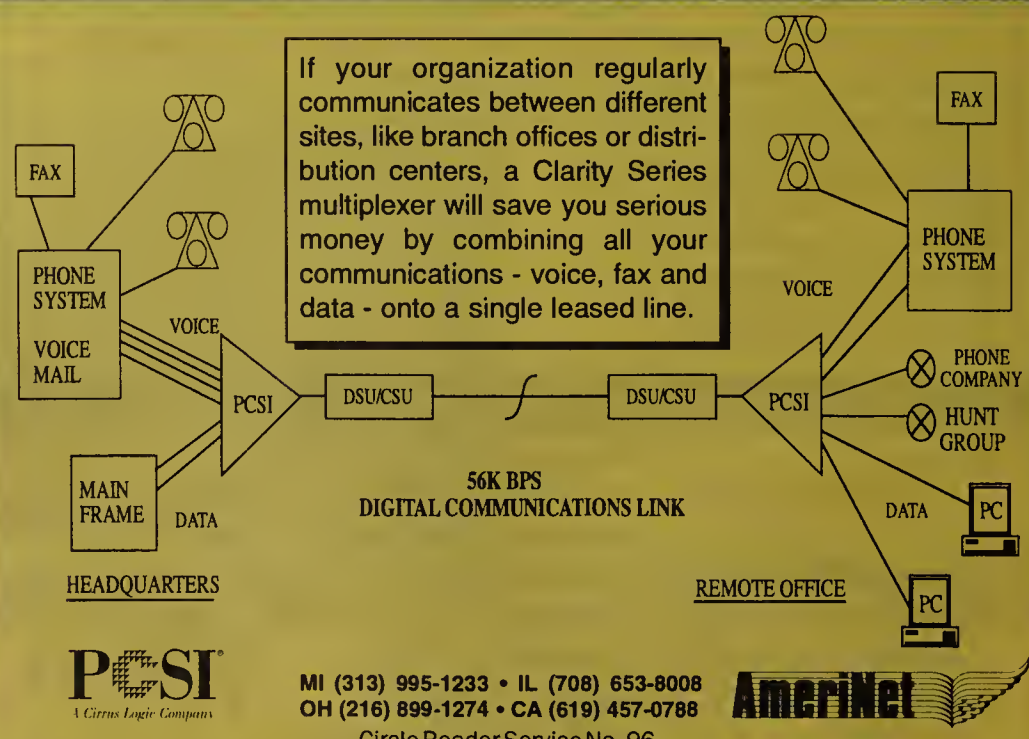

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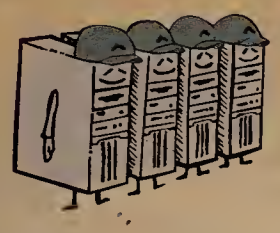

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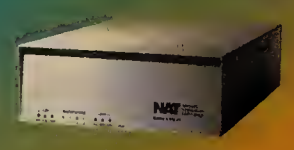

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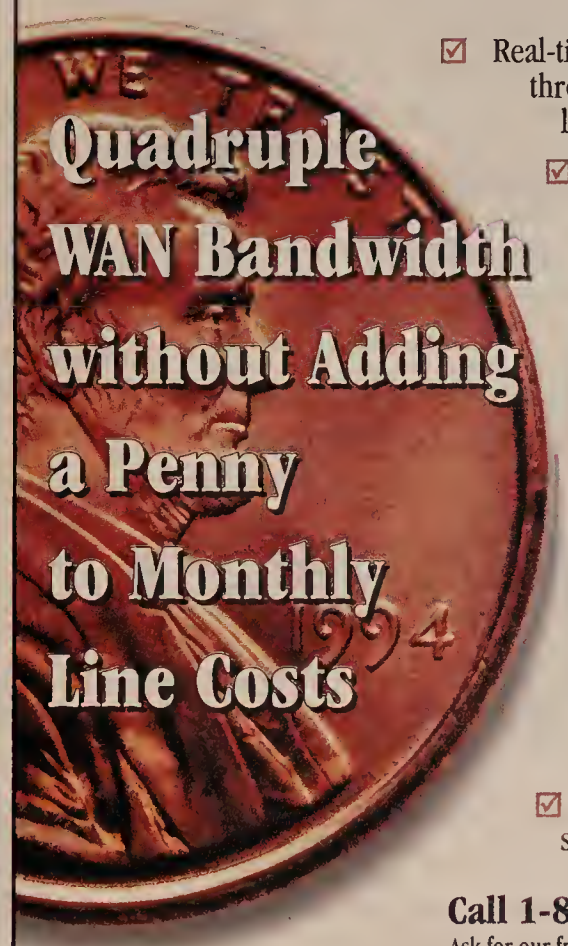

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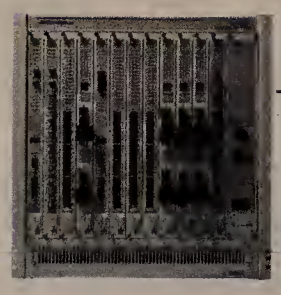

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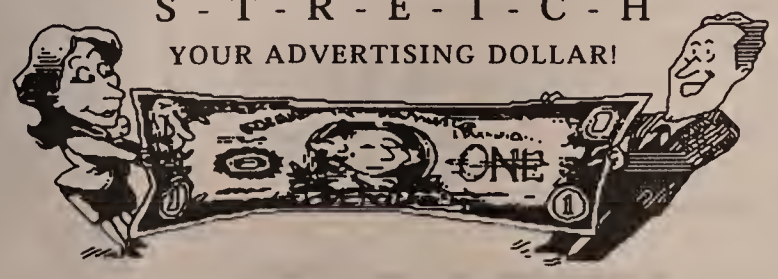

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Continued from page 4

Given such trade concerns, observers agreed that the deal faces tough regulatory scrutiny.

The U.S. Department of Justice last week approved BT's $4.3 billion investment for a 20% stake in MCI (see story). But in doing so, the department pointedly noted that the British market is now highly competitive.

By contrast, the French and German groups overwhelmingly dominate their markets, leading to the fear that U.S. firms other than Sprint may face discrimination in trying to interconnect their nets in these countries.

Nevertheless, the idea of creating new competitors for European and global markets is intriguing to those users who are deeply committed to Sprint domestically.

"It's absolutely significant," said the director of worldwide telecommunications for a large Northeast firm, whose policy bars him from being quoted. "Someone like me, who is in the midst of negotiating with major carriers, needs to understand where they're going to be [internationally] in the future. [Right now], Sprint's presence in Europe is weak."

And the new operating companies hold out the hope of new nodes abroad, giving multinational users additional flexibility and opportunities to save money.

"In the case of AT&T in Switzerland, their hub is in Zurich," said Cargill's Lantto. "If you want to get to Geneva, you have to pay mileage." Message to Sprint: Build a hub in Geneva.

Sprint was widely pictured last week as having leapfrogged over AT&T because of AT&T's failed negotiations last year with the French-German alliance called Eunetcom. But some observers said the new alliance does not automatically give Sprint a trump card in the race for additional global alliances.

For example, Jose Collazo, president of value-added network provider Infonet Corp., dismissed speculation that Sprint could have an inside track on gaining a stake in Infonet just because Infonet's two largest shareholders are the French and German telephone companies.

"These alliances are probably geared to extending the telephony reach of these companies," Collazo added. "The charter of Eunetcom is to be in the outsourcing business."

BT, MCI band to begin Concert

After securing Justice Department approval for their alliance last week, BT and MCI Communications Corp. decided to go ahead and launch their global network services joint venture.

The carriers' Concert venture will be launched despite that the Federal Communications Commission and the European Commission still need to sign off on the deal, which includes BT's purchase of a 20% stake in MCI (*NW*, April 4, page 27).

The carriers expect those approvals within a couple of months, according to Kathleen Flaherty, the joint venture's senior vice president of worldwide sales and marketing.

Concert, previously known as Newco, will operate as a BT subsidiary, developing international services to be marketed by MCI in the Western Hemisphere and by BT in the rest of the world.

Data services initially available include private lines, dial-up lines, X.25, X.75, Systems Network Architecture and frame relay.

Virtual network and application services are planned for the fall, while electronic mail and commerce services are due out in the fall or the first quarter of next year, Flaherty said.

"If you look across what the multinational customer is looking for, we're addressing the full spectrum," she said.

During the next five years, BT and MCI intend to invest $1 billion in Concert. Part of that money will go to set up a backbone network with 5,000 access points in 55 countries by next spring.

Concert is picking up some of BT's and MCI's largest accounts. The joint venture has already taken over British Petroleum, Glaxo and 18 other former customers of Syncordia, BT's now-defunct outsourcing arm. Concert is in discussions with First Data Corp. and Holiday Inn Worldwide, two large MCI customers.

Concert should enjoy a considerable head start on Sprint's pending partnership with Deutsche Bundespost (DBP) Telekom and France Telecom, said Daniel Briere, president of consultancy TeleChoice, Inc. in Verona, N.J.

While Syncordia already had some 20 customers on board, Eunetcom — DBP Telekom's and France Telecom's response to Syncordia — has yet to offer services, he said.

BY BILL BURCH

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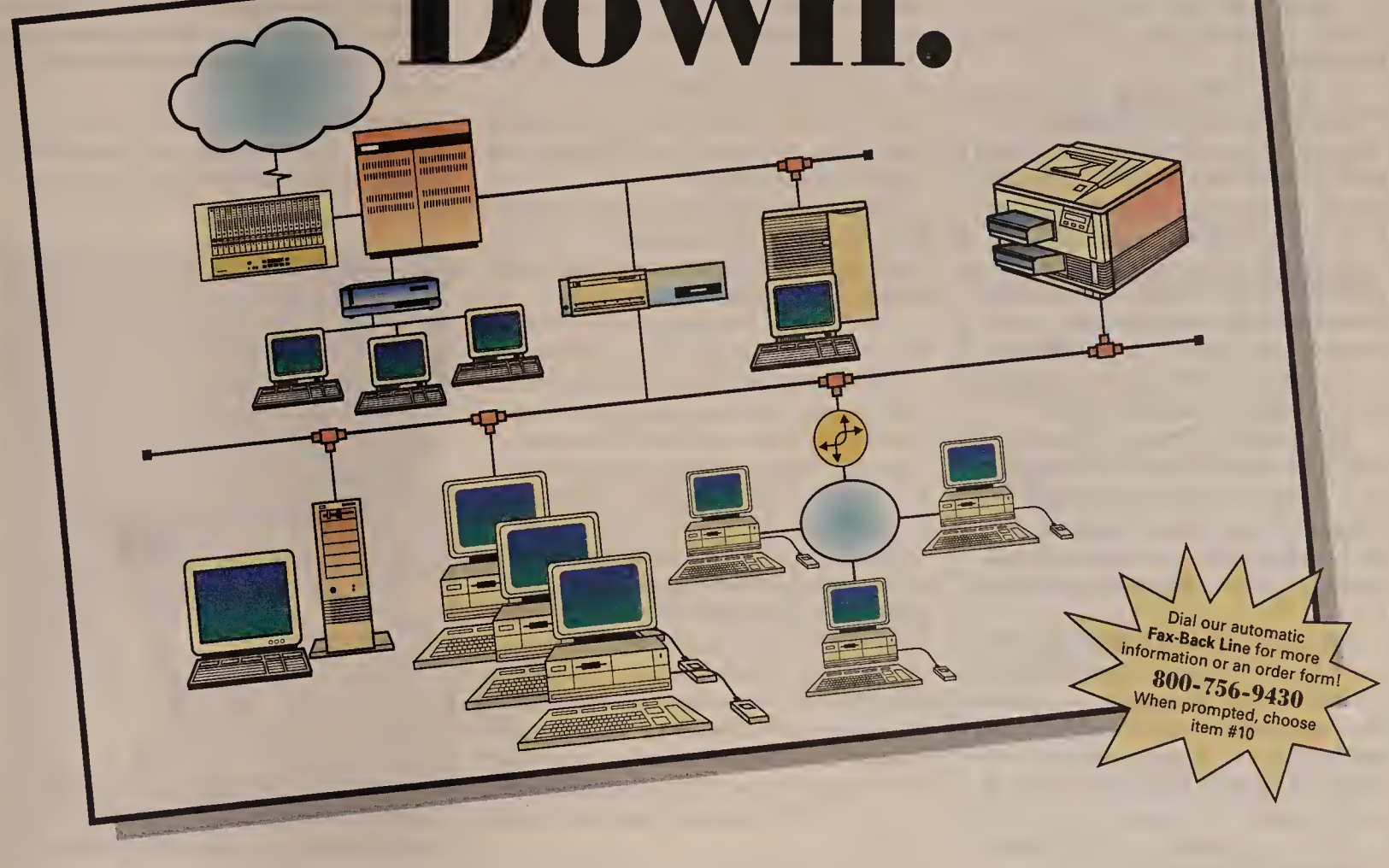

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NETWORK WORLD

Scenario-based mapping

Preparing for the future is much easier if you have an idea of what is going to happen.

That is the idea behind Future Mapping, a scenario-based planning process created by Northeast Consulting Resources, Inc. of Boston.

Scenario-based planning was first used by the military to facilitate strategic planning. It began with a question like, "What do we do if the enemy attacks over there?" Military planners would then build a strategy to answer that question.

The theory is that if you pose enough questions, you will have a strategy in place to handle almost any line of attack.

Businesses can use scenarios the same way, said Mary Johnston Turner, a consultant at Northeast Consulting.

In Future Mapping, Northeast Consulting studies the present condition of an industry or an individual organization and extrapolates five years, assuming the organization followed a particular strategy.

It puts together a number of possible futures, called end states, based on different strategic paths. Then it splits a group of participants into teams to construct a business plan defending each end state.

The teams are given a list of dozens of potential events and asked to vote on how likely it is that each will happen. Events are also used to help defend assumptions made in formulating a business plan for a given end state.

Each team then presents its plan to the entire group. Following the presentations, the group compares the defenses and identifies the strengths and weaknesses of each strategy, looking back from an imagined future.

"It's a process of simulating hindsight," Turner said.

Within a single corporation, the process can build closer ties between the information technology (IT) organization and the business divisions by giving them a common direction.

Conducted with participants from different organizations, such as at last week's IT User Summit, the process gives participants a picture of where common wisdom says the industry is going, Turner said.

Northeast Consulting works with users and vendors across a range of industries. It includes distributed computing, network and systems management, capacity planning and public services among its areas of IT expertise. The company conducts Future Mapping sessions at its offices in Boston and at user sites. For more information, call (617) 654-0600.

BY KEVIN FOGARTY

IT future

Continued from page 1

panies in a given vertical market (see graphic, page 69).

The technique works for individual companies as well as it does for entire industries, Turner said. Bringing representatives of business and IT units into a group to examine possible strategies brings everyone up-to-speed quickly on one another's concerns and gets them moving toward the same goal.

"The future is not predetermined," Turner said. "You can shape it to the goals of your organization if you can identify key issues or events and leverage that information in your planning. But you have to ID your key assumptions about what is going to happen and develop a common set of priorities."

THE END STATES

The most appealing end state among the five presented at the User Summit was one in which companies flatten their organizational structure, putting more decision making power in the hands of individuals. In this scenario, IT organizations must structure their networks and information resources to support empowered individuals using sophisticated communications, work-sharing and decision-support tools.

Another end state was one geared toward a business climate where companies identify microsegments of their customer base and customize products and services for each.

In a third end state, organizations undergo business process reengineering to make their processes more flexible and less expensive. IT leads the way, setting an example and demonstrating the business worth of IT investments by producing firm return-on-investment (ROI) measures to justify technology purchases and development.

Another scenario had companies working to attain a competitive edge by forming global alliances that help them deliver products and services rapidly and economically.

The least popular end state was one in which the chief information officer (CIO) has to answer for an enterprise's bottom line. IT decisions are made on the basis of how quickly they provide a measurable and rapid ROI, not on less tangible measures such as network uptime.

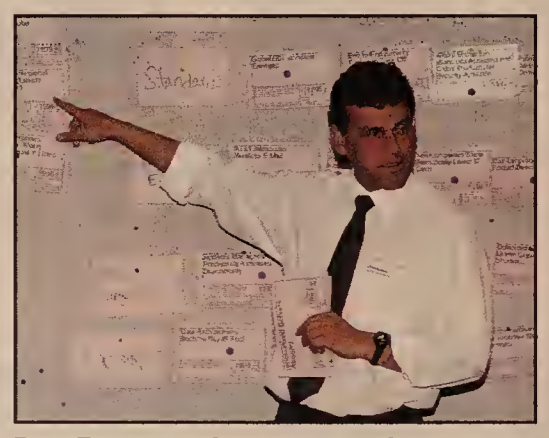
The IT User Summit Class of '94: Seated (from l.): Dugal Easton, Seattle Public Schools; Mary Johnston Turner, NCRI; Dan Delph, American Airlines; Mary Grace Smith, NCRI; Paul Rumble, Barclays Network Services; Joanna Morgan, Cooper Industries; and Doug Michels, SCO. Standing (from l.): Kathy Cruz, VeriFone; Paul Desmond, NW; Scott Duncan, HP; Dennis Connors, Ciba Corning; Ralph Brickey, Tennessee Valley Authority; Linda Heller, OURS; John Grimmett, Barclays; Roger Carrier, CIGNA; Bob Bullock, CH2M Hill; Graham McFarlane, Western Management Consultants; Jack Rathmell, Cooperative Systems; Liz Briso, ITT Hartford; Jed Williams, Clorox; Leo Gilmore, Medical Center of Delaware; Daniel Simpson, Clorox; James Herman, NCRI; John Kelly, NCRI; Art Hutchinson, NCRI; Charles Murray, The Travelers; Henk Hezelhoff, Dow Chemical; Christine Morrison, NCRI; and Lance Ede, EDS.

Doug Michels, executive vice president of The Santa Cruz Operation, Inc. described it this way: "If you can't measure it, you don't do it."

KEY EVENTS

After debating the ups and downs of each end state, the group identified several events that will be critical to the development of any IT scenario, regardless of its vertical market.

Chief among these was the need for companies to employ data architectures as a key information services tool. The architectures define a uniform means of storing and sharing data across an enterprise.



Paul Rumble points out some key events.

"It hit me right between the eyes that that came up," said Joanna Morgan, director of corporate information systems (IS) for Houston-based manufacturer Cooper Industries.

Data architectures "were king" when databases were first being used on corporate mainframes, Morgan said, but the issue has receded as host-based databases matured. However, as companies move to distributed networks and databases, data architectures are becoming more important.

Likewise, network performance and reliability are key to the success of any distributed IT strategy, said Paul Rumble, technology management director of Barclays Network Services, a division of Barclays Bank PLC in Poole, England. Rumble said he underestimated these problems until discussion about the scenarios brought them to the fore.

Morgan had a similar reaction. "Sometimes I think we're crazy" to keep moving forward with sophisticated distributed computing strategies, she said. "We spent 20 years

So what do you do with a Future Map?

First you have to figure out where on the map your company stands, then figure out where you want to go, according to Northeast Consulting Resources, Inc.

Each of the five end states represents a different strategic emphasis. The consensus of participants in last week's IT User Summit was that the most desirable state combined an empowered end user with access to vast information resources. It also involves a flexible information technology (IT) organization with the ability to use detailed customer information to microsegment its market and produce customized goods.

This perception was consistent across every vertical market segment represented in the group.

Elements from each end state will overlap in any IT group's plan, however. At a minimum, IT managers should review the key issues and implications of these end states and develop a model for how they apply to the unique goals and needs of their own enterprise.

Both IT and line-of-business organizations have to buy into whatever plan you come up with, so Northeast Consulting recommends that you put together a multidepartment focus group to develop an end state that closely describes where you want to take your company's IT function.

Then use that end state as a point of perspective from which to judge all your activities, critical IT investments and strategic decisions. Decide whether each decision helps the enterprise reach this target end state.

After developing a target end state, review the events, especially those identified by all the vertical market teams as critical to their success (see graphic, page 69).

Answer the following questions for your IT organization in the context of your target end state:

- Which of these events are important for the success of the IT strategy in my company?
- What type of goals do we need to set in order to prepare for those events or to make sure the event happens?
- In what time frame do we need to meet those goals?
- What types of internal resources are required to meet the goals?
- What is the role of vendors or other outside resources in reaching these goals?
- Who will be responsible for making the goals happen?

BY KEVIN FOGARTY

solving these problems."

All of the group's projections rested on the belief that distributed computing management costs would not rise rapidly and that systems management productivity would increase dramatically.

Such widespread agreement among a diverse group means users should flag these events and pay close attention to them, according to James Herman, vice president at Northeast Consulting. Firms should monitor the events to make sure they occur as expected, adjusting their own plans accordingly.

User groups represented at the summit

- Communications Managers Association (CMA)
- DPMA, The Association for Information Systems Professionals
- International Communications Association (ICA)
- Open User Recommended Solutions (OURS)
- Tele-Communications Association, Inc. (TCA)
- Worldwide Association of Lotus Notes Users & Technologists (WALNUT)

The group also said IT will play an increasingly important role as a direct participant in the business aspects of the enterprise, making staying in touch with general management the No. 1 priority for CIOs.

But all those possibilities depend on the ability of IT to demonstrate that investments in technology will im-prove an organization's bottom line at some point. This means that elements of the end state where cost containment is king, designated as End State A at the summit, will show up across the board.

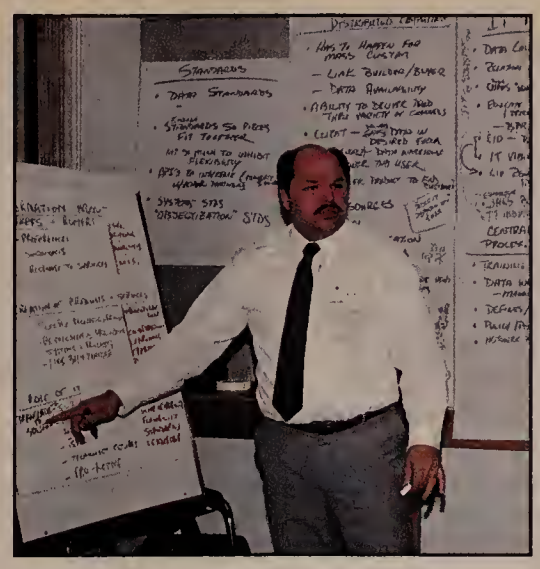
"A is kind of a virus, a constant irritant," said Art Hutchinson, a consultant at Northeast Consulting.

EMPOWERING THE INDIVIDUAL

The most desirable end state, in which individuals are empowered to make many decisions, was also rated as one of the most difficult to attain.

Too many technological hurdles exist — including global security, the need for a unified way to store, access and transfer data, communications standards, availability of applications and stability of networks — to make the model feasible by 1999, the group decided. Pieces of it are possible before then, however.

"This is the end state my company is pursuing," said John Dick, director of internal IS for SynOptics Communications, Inc. "I've got a lot of skin in this game. I'm going there."



Roger Carrier outlines his team's defense.

It's not just for knowledge workers, either. "I'm finding that you could put a [graphical user interface-based] application or a video on a manufacturing line for an illiterate worker," said Cooper Industries' Morgan. "This [process] really broadened my thinking."

COST CONTAINMENT

The group agreed that End State A, where the focus is cost containment, is a kind of default status for many organizations that either do not understand the possibilities of new technology or are unwilling to risk anything for its benefits.

Mary Grace Smith and Ralph Brickey are all ears as their team piots a strategy.

"This is the situation for many companies today; I'm hoping this is not the case in 1999," said Henk Hezelhoff, telecommunications consultant for Dow Chemical.

Cost containment is not a radical change for most IT managers, however. "Personally, I've never had a free hand with the checkbook on projects, so [End State] A constraints have always been there," said Kathy Cruz, director of management IS at VeriFone, Inc.

The most common path to most of these end states, the group decided, is business process reengineering.

Business process reengineering becomes necessary when an organization needs to fundamentally change the way it does things. When the prices for its products hit a ceiling but labor and material costs continue to rise, the only choice for a corporation is to do things more efficiently.

"The idea is to go through [business process reengineering] cyclically, when there's a technological change to let you do things you couldn't before," said Cooper Industries' Morgan. "But it's not a constant process like [Total Quality Management]. Things have to change enough to make you want to tear [your organization] apart and put it back together," she continued.

On the far horizon of attainability is a world in which an organization can develop a global business very quickly and inexpensively by forming alliances in other countries.

The holdup is the lack of global communications and security standards.

Business process reengineering will be a way to get from one IT design to another, and global alliances are nice where you can get them, but in the end, every IT purchase has to be justified in someone's checkbook.

"With all this distributed technology to use [to improve your business], where does the money come from," given that investments in legacy systems still exist? asked Northeast Consulting's Herman. "You can't let go of one vine until you grab the next one."

Cream of the event crop

Four of the five teams rated these events essential for their vision of the future to become reality:

In 1996 or before

- IT must place its focus at the site level.
- Virtual nets for data must be established.

In 1997

- CIO compensation must be tied closely to overall company performance.
- CIO survey indicates the No. 1 priority is to stay in touch with the general management.*
- Data architectures must become key IS tool.*
- Projects to integrate enterprise directory systems must be started.

In 1998

- CIO's top job must be to integrate IT across the enterprise.**
- Desktop management standards must be widely implemented.
- IT coordinating councils must be widely implemented.
- IT groups must optimize intercompany processes.
- Systems management productivity must increase dramatically.*

In 1999

- Distributed IS must support leaner organizational structures.
- IT-savvy senior managers must make CIO job more demanding and effective.
- Just-in-time information must be widely implemented in service and manufacturing sectors.

▲▲▲

Four of five teams said these events must not happen:

- Distributed computing management costs travel on an upward spiral.
- Networks break under load from client/server applications.

▲▲▲

*Also picked by two or more vertical market teams as essential.

**Three teams voted this event essential. Team A voted that it must not happen.

The end states defined

1 is most attainable or desirable, 5 is least.

A Cost control

Aggressive competition and the effects of the recession in the early 1990s keep most companies focusing on the short-term bottom line. IT departments are cost centers, and business units are their cost-driven customers. CIOs receive bonuses for keeping IT spending down. New technologies are adopted only as they are proven to provide a rapid return on investment. Long-term planning is minimal; several generations of legacy technology are maintained in most organizations as companies focus on protecting technology investments.

Attainability: 1
Desirability: 5

B Business process reengineering

Short product life cycles and flattening revenue growth curves prompt many companies to reengineer their processes to be more competitive. IT becomes a central resource by using technology to shorten time to market and improve work flow using groupware applications, strategic replacement of legacy systems and information-sharing strategies. CIO compensation is tied to how well the corporation meets its goal to attain continuous process improvement.

Attainability: 2
Desirability: 3

C Empowerment of the individual

Responding to competitive pressure, corporate structures flatten, pushing decision-making down to individuals who work closely with the customers. IT is responsible for giving those workers the information they need to make decisions, and training is a high priority. IT organizations are distributed across the enterprise for support purposes. Personal productivity is an important measurement of CIO performance.

Attainability: 4
Desirability: 1

D Microsegmentation and mass customization

Data warehousing and data mining enable corporations to segment customers into narrow niches based on factors such as geography, race, ethnicity, religion and buying patterns. IT is given the responsibility of collecting and sifting through data to define market opportunities as well as shortening product development cycles so products can be customized to suit the needs of microsegments. CIOs are compensated based on increased sales and market share.

Attainability: 3
Desirability: 2

E Global alliances

Businesses form partnerships with similar organizations in other companies to reduce the cost of competing globally. Partners share R&D costs, sales and marketing training, and technical support. IT is responsible for sharing information electronically across national boundaries. International standards and security issues are crucial to integrating networks with vastly different hardware and operating systems. CIOs are responsible for juggling relationships, making sure technological resources are available to partners and that solutions are appropriate for the partner's country.

Attainability: 5
Desirability: 4

NetLabs shifts strategy

NetLabs, Inc., the OEM darling of the net management industry, will turn its attention from developing management platforms that compete against products like Hewlett-Packard Co.'s OpenView and focus on applications that run on multiple platforms, analysts and business partners said.

NetLabs would not comment on the strategy shift. But the logic behind the move lies in the business model of network management, observers said.

Analysts say the money to be made in net management is in applications. Though NetLabs' DiMONS 3G platform technology is widely heralded as leading edge — testimonials include the Project Encompass deal with SunSoft, Inc. and an anticipated pact with HP — their applications are also considered topflight, especially in asset management.

Moreover, the market momentum around platforms has clearly swung over to HP's OpenView, with IBM stepping up the pressure in the battle to become the de facto management platform standard.

Rather than compete against its own technology being sold by market giants like SunSoft and HP, NetLabs will develop applications to run on those and other NetLabs-based platforms.

"Look what they did with naming NerveCenter [DiMONS 3G's event handler] and calling out their discovery capability, it's kind of modularizing some of it," said a source at AT&T Global Information Solutions who requested anonymity.

"NetLabs is at a very major business decision to really move into the area of applications," said Charles Robbins, vice president of data communications research at Aberdeen Group, Inc. in Boston.

NetLabs will continue to produce "pieces" of the DiMONS platform, such as NerveCenter, and DiMONS application development tool kits. But continued development of full-scale management platforms is unlikely.

BY JIM DUFFY

OpenView

Continued from page 1

News of the AT&T-HP deal will follow an announcement from HP and NetLabs, Inc. — also scheduled for next week — that calls for HP to license distributed management technology from NetLabs for inclusion in future versions of OpenView (*NW*, April 4, page 1).

It is these versions of OpenView that AT&T will resell under its OEM arrangement with HP, according to sources close to the companies. They will include NetLabs' heralded NerveCenter event management technology and may also include the company's asset management technology.

The AT&T-HP deal means users will be able to manage AT&T switching, transmission and local-area networking gear — including modems, multiplexers, private branch exchanges, bridges, routers and hubs — and gain visibility into the AT&T network for services such as InterSpan frame relay from the same platform they now use to manage their LAN internetworks.

Indeed, AT&T officials have acknowledged privately that their customers are already using OpenView or have been requesting OpenView-based management applications and services from the carrier for some time.

AT&T's Global Information Solutions unit — formerly NCR Corp. — offers a platform called StarSentry based on NetLabs' older NetLabs/Manager technology, and other units, such as AT&T Paradyne and Network Systems, offer proprietary element managers for their products.

"I consider that great news, outstanding," said AT&T GIS user Tom Slechta, director of data center operations at Associated Grocers, Inc. in Seattle. "We use IBM and HP systems in the data center here, and we're running OpenView to monitor them. The fact that we can also monitor the in-store [AT&T GIS] systems with the same tools is wonderful news to me."

"I did look at StarSentry when I chose OpenView, but I didn't think it had the features and universal acceptance that OpenView had," he added.

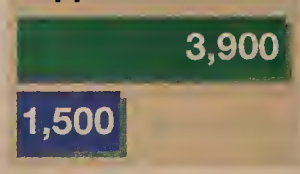
"This will open up a lot of new possibilities for [AT&T GIS users] because there are a lot of third-party applications available for OpenView and there were not as many for StarSentry," said Jill Huntington-Lee, principal analyst at Brandywine Network Associates in Cinnaminson, N.J. "It would reduce the risk of commitment to AT&T solutions."

AT&T, HP and NetLabs officials declined to comment.

As a result of the OEM agreement, AT&T GIS will phase out its StarSentry platform in favor of OpenView with the NetLabs extensions (*NW*, April 4, page 2). AT&T GIS is NetLabs' largest OEM.

AT&T GIS is expected to disclose a migration strategy for existing StarSentry users and applications to the new OpenView platforms.

HP owned 24.8% of the Unix-based network management platform market last year with 3,900 licenses shipped, according to International Data Corp. in Framingham, Mass. NetLabs controlled 9.5% of the market with 1,500 licenses shipped.



StarSentry currently runs many popular applications, such as Remedy Corp.'s Action Request trouble ticketing system, ISICAD, Inc.'s Command physical network manager, Peregrine Systems, Inc.'s ServerView and StationView NetWare management software, Bridgeway Corp.'s EventIX event handler and ProTools, Inc.'s LAN monitoring system.

Likewise, AT&T Paradyne and Network Systems will offer OpenView to their customers, and AT&T Business Communications Services will provide OpenView to users as part of a bandwidth management service offering, the sources said.

AT&T will resell HP's Unix-based Simple Network Management Protocol-based OpenView and Common Management Information Protocol-based OpenView/DM platforms, according to the sources.

AT&T is also interested in a Windows NT version of OpenView, they said.

Comments?

See "Contacts" box on page 2.

NetWare

Continued from page 1

mainframe environment, a move analysts said will give NetWare the enterprise flavor it has been sorely lacking.

The products will also largely eliminate the need for Systems Network Architecture gateways on NetWare local nets.

"Novell doesn't even realize how important this is," said Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C.

"Today, Novell has the NetWare for SAA gateway, which is all well and good, but it's still a gateway — it's not a seamless environment," Dzubeck said. "This announcement is key to getting Novell into a lot of enterprise situations."

Although Novell officials would not comment on the announcement, a company spokesman said: "Novell is committed to ensuring that customers with both mainframe and NetWare environments have the best integration possible. Novell will pursue partnerships with companies and look at technology to make that integration between those two environments better for our enterprise customers."

News of this type of development effort first surfaced last year, but analysts were uncertain if it would ever come to fruition (*NW*, Nov. 29, page 1).

BRINGING IT TOGETHER

Sources said the primary product resulting from the agreement will be an IPX/SPX protocol stack that resides on the IBM 3172 Interconnect Controller, which attaches LANs to mainframe channels.

The initial release of the stack is due out in the fourth quarter. Future releases will run on a channel-attached router, eliminating the need for the 3172.

The product will eliminate the need for NetWare-to-SNA gateways, although terminal emulation software will still be required for users that are accessing 3270-based applications.

Dzubeck said the stack will also pave the way for users to more seamlessly run newer high-end, transaction-processing (TP) types of applications on the mainframe, which already supports tried-and-true TP monitors. No gateway or terminal emulation would be required since IPX would be the transport protocol and the applications would not be 3270-based.

With the new stack, the mainframe will also be able to act as a NetWare server for storage, backup or any number of other applications. To add value, the companies will work to port NetWare services, such as the NetWare Directory Service (NDS) and management applications, to the mainframe.

The companies will also reiterate their plans to integrate NDS with IBM's host-based Remote Access Control Facility (RACF), first discussed in March (*NW*, March 7, page 1). RACF will bring a mainframe level of security to NetWare LANs when the integrated product ships in the fourth quarter.

"Once there are some key services on the host, you'll be able to access these services natively," said Igor Stenmark, director of the software management strategies service at Gartner Group, Inc., a consulting firm in Stamford, Conn. "In fact, you could have your mainframe disk partitioned into 1,000 servers, whereas before you'd have to have 1,000 different boxes."

That would give users far fewer boxes to manage, Stenmark said.

Customers welcomed that idea as well as the thought of using fewer protocols.

"Now we have SNA running on those workstations that need access to the host," said Vish Rao, engineering manager at Icot Corp., a NetWare and IBM mainframe user in Meadow Vista, Calif. "It would be great to have the number of protocols on our workstations reduced. It would simplify configuration and ease management."

NETWORK NAVIGATOR

Also next week, the two companies will announce that Proginet is taking over development and marketing of the MVS mainframe portion of Network Navigator, the software distribution product Novell gained when it acquired Annatek Systems, Inc. in 1992.

According to sources, the companies plan to make the LAN and mainframe versions compatible. This will let users distribute software from the mainframe to the server, which can then distribute to clients.

"Novell hadn't done any development on the mainframe version of Network Navigator — it was questionable what Novell planned to do with this," Stenmark said.

NETWORK WORLD

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Second-class postage paid at Framingham, Mass., and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

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ISSN number: 0887-7661.

"If You Swim in Muddy Water, the Alligators Will Eat You"

BY GERRY MURRAY
International Data Corporation

A friend of ours recently joined an adventure travel group on a canoeing expedition to Africa. In order to go on the expedition, the group had to survive booster shots for malaria and other exotic diseases, a 14 hour flight, and an unbelievably hot and bumpy ride from the airport to the outfitters and then to the river. Finally, after learning to paddle and getting a week's food and equipment loaded in their canoes, they received what was the most important survival mantra of the trip: "If you swim in muddy water, the alligators will eat you."

Happily all survived the gators. For many MIS professionals trying to cope with the ever darkening waters surrounding technologies such as workflow, groupware, and document management, the ability to make a choice and get to clearer waters is becoming a similar matter of survival. Fortunately, there are guides to help you navigate your way to safety in these waters as well.

The latest news from the IT industry is that white collar productivity will explode in the 90s. As a result, there are a lot of vendors out there offering convenient ways to conceptualize how white collar processes operate. They inevitably result in iconic models that are supposed to be able to simulate actual operating procedures. This approach may be sufficient for highly structured, repetitive transaction processing environments. However, once we leave the world of predictable workloads and limited exceptions, we find that work doesn't really flow, it must be managed.

The key to automating white collar workers is understanding that their world is not defined by repetitive tasks, but by repetitive links. Automating these links requires IS professionals to not only get religion on this idea, but to learn a new set of skills. What new skills? Well, you have new processes, therefore you need a new way of analyzing and modeling them. More importantly perhaps, you have a different kind of employee, someone who is more experienced, more powerful, and more highly educated than the typical transaction processing operator. As a result, automating line of business managers and senior executives requires a whole new approach from IS. Substantial consideration must be given to the organizational implications of information systems for this level of employee, because they are very sensitive to systems that change the way they access, assimilate and act on information. In addition, the reasons for employing technology must be justified on the bottom line.

The key to automating white collar workers is understanding that their world is not defined by repetitive tasks, but by repetitive links.

Lastly, IS is going to need new automation tools. There are a few of them out there already, but deciding which is best for your organization depends on a lot of things—existing systems, short term and long term objectives, the level of computer literacy and receptivity to change in the organization, your business model, and the competitive environment you're in to name just a few. As the market for work management technologies emerges, there will be a blending of lines between some well-defined technologies and some not so well-defined ones. Technology infrastructures such as mainframes, LANs, databases, and imaging will have to be smoothly integrated with workflow, document management, groupware, and folder software, etc. In addition, end users will demand greater control over these systems, adding new usability requirements on top of everything else. Through it all, IS managers must stay focused on the fact that the choice of technologies must be primarily driven by the nature of the business processes being automated.

If you are in the midst of "rastling with the gators," grab your favorite line of business manager and plan to attend IDC/Avante's *Work Management '94: The Conference on Business Process Automation*, September 28-30 in Washington DC, where you'll receive a first class education on business process analysis, a variety of work management technologies, and measuring the financial impact of technology. For more information call (508) 935-4100.

Gerry Murray is an analyst with IDC/Avante Technologies, a Framingham, MA market research firm that specializes in providing expertise on workflow, imaging, and related technologies to vendors and IT customers. The company recently completed a landmark study *Lotus Notes - Agent of Change: The Financial Impact of Notes on Business.*

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Please provide your business address below.

1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Healthcare Services
05. ☐ Hospitality
06. ☐ Retail/Wholesale Trade/Business Services
07. ☐ Transportation
08. ☐ Utilities
09. ☐ Education
10. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
11. ☐ Government (Federal/State/Local)
12. ☐ Military
13. ☐ Aerospace
14. ☐ Consultants (Independent)
15. ☐ Carriers/Interconnects
16. ☐ Manufacturers (Computer/Communications)
17. ☐ VAR/VAD/VAN/Systems Houses/ Software Houses
18. ☐ Distributors,Communications/Computers
19. ☐ Other_____

2 What Is your Job Function? (check one only)

NETWORK IS Management:

1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS,IT,MIS,Systems Management
5. ☐ Engineering Management

CORPORATE MANAGEMENT:

6. ☐ Corporate Management(CIO,CEO,PRES,VP, DIR,MGR,Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other_____

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49
4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)

1. ☐ Corporatewide
2. ☐ Multienterprise
3. ☐ Departmental
4. ☐ None

B. INVOLVEMENT (check all that apply)

1. ☐ Recommend/ Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in columns A and B:

A: I am involved in the purchase of the following products/services.

B: I plan to purchase the following products/services.

A	B	LOCAL AREA NETWORKS
☐	☐ 01.	Local Area Networks
☐	☐ 02.	LAN Operating Systems Software
☐	☐ 03.	LAN Services
☐	☐ 04.	LAN Storage Devices (optical, tape,disk,etc.)
☐	☐ 05.	LAN Backup systems (optical,tape,disk,etc.)
☐	☐ 06.	Network Test Equipment
☐	☐ 07.	Intelligent Hubs
☐	☐ 08.	Cables, Connectors, Baluns
☐	☐ 09.	UPS
☐	☐ 10.	Network Adapter boards
☐	☐ 11.	Peer-to-Peer LANs
☐	☐ 12.	Wireless Networks
☐	☐ 13.	SNMP Network Management
☐	☐ 14.	ATM (Asynchronous Transfer Mode)
☐	☐ 15.	Remote Access LANs

A	B	NETWORK SERVERS
☐	☐ 16.	LAN Servers
☐	☐ 17.	File Servers/Applications Servers
☐	☐ 18.	Print Servers
☐	☐ 19.	Communications Servers/Fax Servers
☐	☐ 20.	Data Base Servers (Oracle, Sybase, etc.)
☐	☐ 21.	Superservers
☐	☐ 22.	Terminal Servers
☐	☐ 23.	Remote Access Servers

A	B	INTERNETWORKING
☐	☐ 24.	Bridges
☐	☐ 25.	Routers
☐	☐ 26.	Gateways
☐	☐ 27.	Bridge/Routers
☐	☐ 28.	Intelligent Hubs
☐	☐ 29.	Communications Servers

A	B	COMPUTERS/PERIPHERALS
☐	☐ 30.	Micros/PCs
☐	☐ 31.	Minis
☐	☐ 32.	Mainframes
☐	☐ 33.	Pen-Based
☐	☐ 34.	Laptops
☐	☐ 35.	Workstations
☐	☐ 36.	Image Processing Workstations
☐	☐ 37.	Front-End Processors
☐	☐ 38.	Terminals
☐	☐ 39.	Printers
☐	☐ 40.	Cluster Controllers
☐	☐ 41.	Fax Machines
☐	☐ 42.	X-Terminals

A	B	SOFTWARE/APPLICATIONS
☐	☐ 43.	Network Management
☐	☐ 44.	Micro to Mainframe
☐	☐ 45.	Security
☐	☐ 46.	Communication/Terminal Emulation
☐	☐ 47.	Word Processing
☐	☐ 48.	Operating Systems
☐	☐ 49.	Business Applications(Finance/ Mfg/HR/etc.)
☐	☐ 50.	Applications Development
☐	☐ 51.	Data Base Management
☐	☐ 52.	Spreadsheet
☐	☐ 53.	Groupware
☐	☐ 54.	EDI
☐	☐ 55.	E-Mail
☐	☐ 56.	Windows/Graphical User Interface
☐	☐ 57.	4GL Development
☐	☐ 58.	Multimedia
☐	☐ 59.	Graphics
☐	☐ 60.	Remote Access

A	B	WIDE AREA NETWORKS
☐	☐ 61.	Modems (9.6K bps and over)
☐	☐ 62.	Modems (under 9.6K bps)
☐	☐ 63.	T-1
☐	☐ 64.	T-3
☐	☐ 65.	Fractional T-1
☐	☐ 66.	Data Switches
☐	☐ 67.	SMDS
☐	☐ 68.	ATM (Asynchronous Transfer Mode)
☐	☐ 69.	Matrix Switches
☐	☐ 70.	Packet Switches
☐	☐ 71.	Protocol Converters
☐	☐ 72.	Diagnostic/Test Equipment
☐	☐ 73.	DSU/CSU
☐	☐ 74.	Microwave
☐	☐ 75.	Fax Boards/Modems
☐	☐ 76.	VSAT
☐	☐ 77.	Fiber Optic
☐	☐ 78.	Satellite
☐	☐ 79.	ISDN
☐	☐ 80.	PBXs(over 1000 lines)
☐	☐ 81.	PBXs(under 1000 lines)
☐	☐ 82.	Automatic Call Distributors
☐	☐ 83.	Voice Messaging Systems
☐	☐ 84.	Videoconferencing/ Teleconferencing Systems
☐	☐ 85.	Voice Response/Processing
☐	☐ 86.	Dedicated Leased Line
☐	☐ 87.	Switched Data
☐	☐ 88.	Centrex
☐	☐ 89.	E-Mail/Online Services
☐	☐ 90.	Image Processing
☐	☐ 91.	Local Services
☐	☐ 92.	WATS/MTs
☐	☐ 93.	International
☐	☐ 94.	Virtual Networks
☐	☐ 95.	Frame Relay
☐	☐ 96.	Value Added Services
☐	☐ XX.	None of the above(1-96)

6 What is the total number of A:LANS B:Workstations/Nodes in your organization?

	LANs A		Workstations/ Nodes B
1.	☐	5000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	9 or less	☐

7 Which of the following network platforms are currently installed/planned? (check all that apply)

NETWORK ARCHITECTURES

Installed A	Planned B	
☐	☐ 01.	SNA
☐	☐ 02.	DECNET
☐	☐ 03.	MAP/TOP
☐	☐ 04.	TCP/IP
☐	☐ 05.	DCA (Unisys)
☐	☐ 06.	X.25
☐	☐ 07.	Novell IPX/SPX
☐	☐ 08.	APPC/APPN/LU6.2
☐	☐ 09.	NETBIOS
☐	☐ 10.	OSI
☐	☐ 11.	APPLETALK
☐	☐ 12.	OTHER_____

LAN OPERATING SYSTEM

☐	13. ☐ LOCALTALK (APPLETALK)
☐	14. ☐ BANYAN (VINES)
☐	15. ☐ DCA (IRMALAN)
☐	16. ☐ DCA (10-NET)
☐	17. ☐ IBM (LAN SERVER)
☐	18. ☐ IBM (PC LAN PROGRAM)
☐	19. ☐ MICROSOFT (LAN MANAGER)
☐	20. ☐ UNGERMANN-BASS (NET/1)
☐	21. ☐ NOVELL (NETWARE,2X,3X,4X)
☐	22. ☐ PROTEON (PRONET)
☐	23. ☐ SITKA (TOPS)
☐	24. ☐ 3COM (3+,3+OPEN)
☐	25. ☐ ARTISOFT (LANTASTIC)
☐	26. ☐ HAYES (LANSTEP)
☐	27. ☐ DEC (PATHWORKS)
☐	28. ☐ OTHER_____

LAN ENVIRONMENT

☐	29. ☐ 4M TOKEN RING
☐	30. ☐ 16M TOKEN RING
☐	31. ☐ ARCNET
☐	32. ☐ ETHERNET
☐	33. ☐ STARLAN
☐	34. ☐ FDDI
☐	35. ☐ LOCAL TALK
☐	36. ☐ 10BASE-T
☐	37. ☐ OTHER_____

OPERATING SYSTEM

☐	38. ☐ DOS
☐	39. ☐ UNIX/XENIX/AIX
☐	40. ☐ OS/2
☐	41. ☐ OS/2 2.X
☐	42. ☐ MVS
☐	43. ☐ VM
☐	44. ☐ VMS
☐	45. ☐ MACINTOSH
☐	46. ☐ WINDOWS
☐	47. ☐ WINDOWS NT
☐	48. ☐ X WINDOWS
☐	49. ☐ SOLARIS
☐	50. ☐ OTHER_____

8 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes Installed	Mainframes Planned	Minis Installed	Minis Planned
01. IBM	☐	☐	☐	☐
02. DEC	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER _____	☐	☐	☐	☐

MICROCOMPUTERS (fill in the numbers)

	INSTALLED	PLANNED
11. Macintosh 20,30,40		
12. Macintosh other		
13. PCs based on Pentium		
14. PCs based on 80486		
15. PCs based on 80386		
16. PCs based on 80286		
17. PCs based on 8086/8088		
18. RISC/Unix based wkstns		
19. Other		

10 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

1. ☐ $100 million and over
2. ☐ $50 - $99.9 million
3. ☐ $25 - $49.9 million
4. ☐ $20 - $24.9 million
5. ☐ $10 - $19.9 million
6. ☐ $5 - $9.9 million
7. ☐ $1 - $4.9 million
8. ☐ $500,000 - $999,999
9. ☐ $499,999 or less

11 Estimated gross annual revenues of your entire company/institution: (check one only)

1. ☐ Over $10 billion 2. ☐ 1 to $9.9 billion
3. ☐ $500 to $999.9 million 4. ☐ $100 to $499.9 million
5. ☐ $50 to $99.9 million 6. ☐ $10 to $49.9 million
7. ☐ $5 to $9.9 million 8. ☐ $4.9 million or less

12 Estimated number of employees for your entire corporation: (check one only)

1. ☐ Over 10,000 2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999 4. ☐ 1,000 - 2,499
5. ☐ 500 - 999 6. ☐ 499 or less

2 FOLD HERE

PLEASE PROVIDE YOUR NAME, TITLE AND BUSINESS ADDRESS

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05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government Federal/State/Local
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Systems/Network Integraters (VAR/VAD/ VAN/Systems/Software Houses)
19. ☐ Distributors Communications/Computers
20. ☐ Other_____

2 What is your Job Function? (check one only)

NETWORK IS Management:

1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS,IT,MIS,Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management(CIO,CEO,PRES,VP, DIR,MGR,Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other_____

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)	B. INVOLVEMENT (check all that apply)
1. ☐ Corporatewide	1. ☐ Recommend/Specify
2. ☐ Multienterprise	2. ☐ Approve
3. ☐ Departmental	3. ☐ Evaluate
4. ☐ None	4. ☐ Determine the need
	5. ☐ None

5 Check ALL that apply in columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services.

A	B	LOCAL AREA NETWORKS
☐	01. ☐	Local Area Networks
☐	02. ☐	Network Operating Systems Software (NOS)
☐	03. ☐	LAN Storage Devices (optical, tape, disk, etc.)
☐	04. ☐	LAN Backup Systems (optical, tape, disk, etc.)
☐	05. ☐	Network Test Equipment/Diagnostic/ Management Software
☐	06. ☐	Hubs/Intelligent Hubs
☐	07. ☐	Cables, Connectors, Baluns
☐	08. ☐	UPS
☐	09. ☐	Network Adapter Boards/Network Interface Cards
☐	10. ☐	Peer-to-Peer LANs
☐	11. ☐	Wireless Networks
☐	12. ☐	SNMP Network Management
☐	13. ☐	ATM Switches
☐	14. ☐	Remote LAN Access
☐	15. ☐	Ethernet Switches
☐	16. ☐	LAN Servers
☐	17. ☐	Superservers
☐	18. ☐	Remote Access/Communications Servers

A	B	REMOTE/WIRELESS COMPUTING
☐	19. ☐	Laptops
☐	20. ☐	Notebooks
☐	21. ☐	PDAs
☐	22. ☐	PCMCIA
☐	23. ☐	Mobile Data Services
☐	24. ☐	Wireless Data Services
☐	25. ☐	Wireless Data Equipment

A	B	INTERNETWORKING
☐	26. ☐	Bridges
☐	27. ☐	Routers
☐	28. ☐	Gateways
☐	29. ☐	Bridge/Routers

A	B	COMPUTERS/PERIPHERALS
☐	30. ☐	Micros/PCs
☐	31. ☐	Minis
☐	32. ☐	Mainframes
☐	33. ☐	Workstations
☐	34. ☐	Front-End Processors
☐	35. ☐	Terminals
☐	36. ☐	Printers
☐	37. ☐	Cluster Controllers
☐	38. ☐	Fax Machines
☐	39. ☐	Monitors

A	B	SOFTWARE/APPLICATIONS
☐	40. ☐	Network Management
☐	41. ☐	Systems Management
☐	42. ☐	Micro to Mainframe
☐	43. ☐	Security
☐	44. ☐	Communication/Terminal Emulation
☐	45. ☐	Word Processing
☐	46. ☐	Operating Systems
☐	47. ☐	Client Server Applications Development
☐	48. ☐	Applications Development
☐	49. ☐	Data Base Management/RDBMS
☐	50. ☐	Spreadsheet
☐	51. ☐	Groupware
☐	52. ☐	EDI
☐	53. ☐	E-Mail
☐	54. ☐	Windows/Graphical User Interface
☐	55. ☐	4GL Development/Case
☐	56. ☐	Multimedia
☐	57. ☐	Graphics/DTP

A	B	SOFTWARE/APPLICATIONS (cont'd)
☐	58. ☐	Remote Access
☐	59. ☐	Imaging
☐	60. ☐	Suites
☐	61. ☐	Middleware
☐	62. ☐	Document Management

A	B	WIDE AREA NETWORKS EQUIPMENT & SERVICES
☐	63. ☐	Modems (9.6K bps and over)
☐	64. ☐	Modems (under 9.6K bps)
☐	65. ☐	T-1/T-3 Multiplexers
☐	66. ☐	T-1/T-3 Services
☐	67. ☐	Inverse Multiplexers
☐	68. ☐	Fractional T-1
☐	69. ☐	SMDS
☐	70. ☐	ATM (Asynchronous Transfer Mode)
☐	71. ☐	Matrix Switches
☐	72. ☐	Packet Switches
☐	73. ☐	Protocol Converters
☐	74. ☐	Diagnostic/Test Equipment
☐	75. ☐	DSU/CSU
☐	76. ☐	Microwave
☐	77. ☐	Fax Boards/Modems
☐	78. ☐	VSAT
☐	79. ☐	Fiber Optic
☐	80. ☐	Satellite
☐	81. ☐	ISDN
☐	82. ☐	PBXs (over 1000 lines)
☐	83. ☐	PBXs (under 1000 lines)
☐	84. ☐	Automatic Call Distributors
☐	85. ☐	Voice Messaging Systems
☐	86. ☐	Videoconferencing/Teleconferencing
☐	87. ☐	Voice Response/Processing
☐	88. ☐	Dedicated Leased Line
☐	89. ☐	Switched Data
☐	90. ☐	E-Mail/Online Services
☐	91. ☐	Image Processing
☐	92. ☐	800/900 Services
☐	93. ☐	WATS/MTS
☐	94. ☐	International
☐	95. ☐	Virtual Networks
☐	96. ☐	Frame Relay
☐	97. ☐	Value Added Services
☐	98. ☐	CIT (Computer-Integrated Telephony)
☐	99. ☐	None of the above (1-96)

6 What is the total number of LANS, Workstations/Nodes: At this Location/ In your Organization?

At This Location:

	LANs		Workstations/ Nodes
1.	☐	5000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	9 or less	☐
7.	☐	None of the above	☐

Entire Organization:

	LANs		Workstations/ Nodes
1.	☐	5000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	9 or less	☐
7.	☐	None of the above	☐

7 Which of the following network platforms are currently installed/planned? (check all that apply)

Installed A	Planned B	NETWORK ARCHITECTURES
☐	01. ☐	SNA
☐	02. ☐	DECNET
☐	03. ☐	MAP/TOP
☐	04. ☐	TCP/IP
☐	05. ☐	DCA (Unisys)
☐	06. ☐	X.25
☐	07. ☐	Novell IPX/SPX
☐	08. ☐	APPC/APPN/LU6.2
☐	09. ☐	NETBIOS
☐	10. ☐	OSI
☐	11. ☐	APPLETALK
☐	12. ☐	NSF
☐	13. ☐	XNS
☐	14. ☐	OTHER_____

		NETWORK OPERATING SYSTEM
☐	15. ☐	LOCALTALK (APPLETALK)
☐	16 ☐	BANYAN (VINES)
☐	17. ☐	DCA (IRMALAN)
☐	18. ☐	DCA (10-NET)
☐	19. ☐	IBM (LAN SERVER)
☐	20. ☐	IBM (PC LAN PROGRAM)
☐	21. ☐	MICROSOFT (LAN MANAGER)
☐	22. ☐	NOVELL (NETWARE, 2X, 3X, 4X)
☐	23. ☐	PROTEON (PRONET)
☐	24. ☐	3COM (3+, 3+OPEN)
☐	25. ☐	ARTISOFT (LANTASTIC)
☐	26. ☐	HAYES (LANSTEP)
☐	27. ☐	DEC (PATHWORKS)
☐	28. ☐	WINDOWS NT/ADVANCED SERVER
☐	29. ☐	OTHER_____

		LAN ENVIRONMENT
☐	30. ☐	4M TOKEN RING
☐	31. ☐	16M TOKEN RING
☐	32. ☐	ARCNET
☐	33. ☐	ETHERNET
☐	34. ☐	100 M ETHERNET
☐	35. ☐	STARLAN
☐	36. ☐	FDDI
☐	37. ☐	LOCAL TALK
☐	38. ☐	10BASE-T
☐	39. ☐	ATM
☐	40. ☐	OTHER_____

		COMPUTER OPERATING SYSTEM
☐	41. ☐	DOS
☐	42. ☐	UNIX/XENIX/AIX
☐	43. ☐	OS/2
☐	44. ☐	OS/2.X
☐	45. ☐	IBM MVS
☐	46. ☐	IBM VM
☐	47. ☐	DIGITAL VMS
☐	48. ☐	MACINTOSH
☐	49. ☐	WINDOWS
☐	50. ☐	WINDOWS NT
☐	51. ☐	X WINDOWS
☐	52. ☐	SOLARIS
☐	53. ☐	OTHER_____
☐	54. ☐	NONE OF THE ABOVE

8 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes		Minis	
	Installed	Planned	Installed	Planned
01. IBM	☐	☐	☐	☐
02. DIGITAL	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER_____	☐	☐	☐	☐

Which of the following do you have installed/ planned:
(USE NUMBERS ONLY)

	At This Location		Entire Organization	
	Servers	Clients/ Nodes	Servers	Clients/ Nodes
11. POWER MACINTOSH				
12. MACINTOSH OTHER				
13. POWER PC BASED				
14. PENTIUM BASED				
15. 80486 BASED				
16. 80386 BASED				
17. 80286 BASED				
18. 80806/80808 BASED				
19. ALPHA BASED				
20. RISC/UNIX BASED WORKSTATIONS				
21. OTHER				

10 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

01. ☐ $100 million and over
02. ☐ $50 - $99.9 million
03. ☐ $25 - $49.9 million
04. ☐ $20 - $24.9 million
05. ☐ $10 - $19.9 million
06. ☐ $5 - $9.9 million
07. ☐ $1 - $4.9 million
08. ☐ $500,000 - $999,999
09. ☐ $499,999 or less
10. ☐ NONE OF THE ABOVE

11 Estimated gross annual revenues of your entire company/institution: (check one only)

1. ☐ Over $10 billion
2. ☐ $1 to $9.9 billion
3. ☐ $500 to $99.9 million
4. ☐ $100 to $499.9 million
5. ☐ $50 to $99.9 million
6. ☐ $10 to $49.9 million
7. ☐ $5 to $9.9 million
8. ☐ $4.9 million or less
9. ☐ NONE OF THE ABOVE

12 Estimated number of employees for your entire corporation: (checl all that apply)

1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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Thank you